ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE I INVESTIGATION

Lederle Lab
Site No. 344003
Pearl River, Rockland County

Final - May, 1988

Prepared for :

New York State Department of Environmental Conservation

50 Wolf Road, Albany, New York 12233
Thomas C. Jorling, Commissioner

Division of Hazardous Waste Remediation
Michael J. O'Toole, P.E., Director

Prepared by :

GIBBS & HILL, INC.

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CONTENTS

1. EXECUTIVE SUMMARY

The Lederle Lab Landfill (New York I.D. No. 344003, EPA I.D. No. NYD054065909) is located in Pearl River, Rockland County, New York (see Figure 1). Lederle Laboratories, a division of American Cyanamid Company, produces a full line of pharmaceutical and biological products. At this facility there are four landfills (see Figure 2). The landfills of concern, landfill 1 and 2, were operated from the 1920's until 1979 and cover a 12 acre area. Landfill 2 was placed on top of landfill 1 and was active from 1966 to 1979. The landfills have no liner and are in the groundwater table. Both landfill 2A and landfill 3, have appropriate liners and operate under New York State (NYS) 6NYCRR Part 360.

A stream, Muddy Creek, originally flowed through the landfill site. Muddy Creek was relocated and now flows along the east side of the landfill area. Landfills 1 and 2 are in this old stream bed (see Figure 2).

When landfills 1 and 2 were closed on September 1, 1979, an estimated 677,800 tons of waste had been deposited since 1946. Landfills 1 and 2 had received incinerator ash, glass, paper, wood, cardboard, metal, vitamins, wastewater treatment sludge, fermentation cake and reactive and explosive chemicals. According to Carlene D. Bassell, Mgr. Environmental Technology with Lederle, waste solvents were burned in an open pit within the perimeter of landfill 1 and acids were neutralized before placement in landfill 1. These activities occurred during the period 1946 to 1962. Documentation also shows that heavy metals, nonpolar solvents, oils and oil sludges, alcohols, salts, pharmaceutical wastes, paints and pigments and asbestos were disposed in the landfills.

Eight groundwater monitoring wells which were installed up and downgradient of the site are used as reference in the report (see

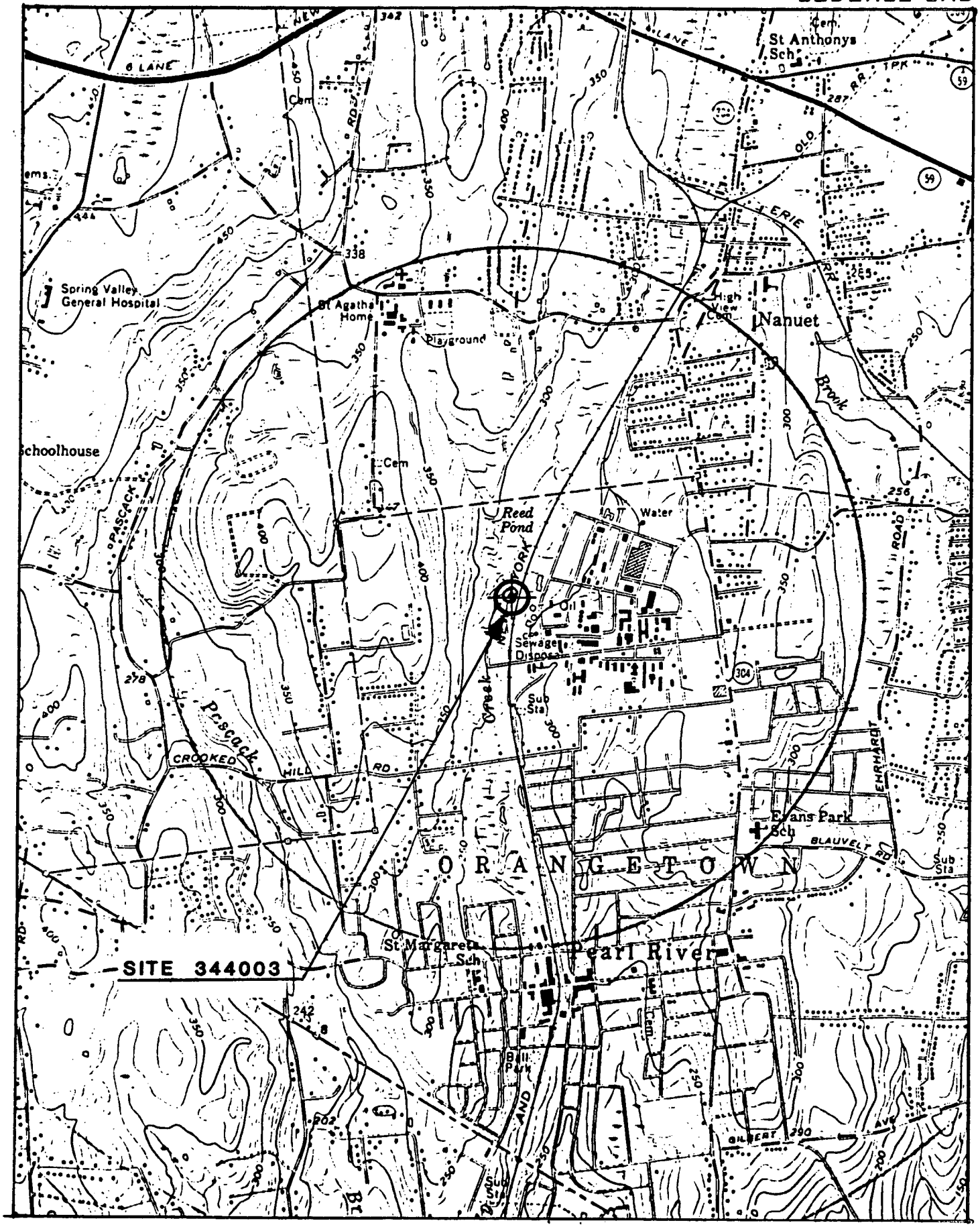
Figure 2). Levels of heavy metals and phenols exceeding 10NYCRR Part 703.5 have been found in the groundwater. The surface waste is also monitored.

The preliminary HRS scores for this site are as follows: Migration score, Sm = 35.37; Groundwater score, Sgw = 61.15, Surface Water score, Ssw = 2.30; Air score, Sa = 0; Fire and Explosion score, Sfe = 27.71 and Direct Contact score, Sdc = 0. Air routes receive a "no score" because no air sampling data is available. The high groundwater score is the result of a large target population, the presence of toxic and persistent materials, and sampling data from on site monitoring wells showing levels of phenols and heavy metals which exceed NYS water quality standards. Muddy Creek is not used within three miles downstream of the site. The Fire and Explosion score is based on documentation which states that "reactive/explosive" chemicals were deposited at the site. Direct contact is not a concern due to the security at the site and the adequate cover on the landfills [A-1, (Appendix A, Reference 1), Photo #5,6,7].

Gibbs & Hill (G&H) recommends that a Phase II investigation be performed at this site. Groundwater contamination downgradient of the site may be the result of hazardous materials known to have been deposited at the site. The existing data are inadequate to positively attribute contamination to the site. Additional, relevant sampling data are required to determine the extent and source of any groundwater contamination in the area.

Figure 1

LEDERLE LAB



N

COORDINATES:

LAT. 41 04' 30"

LONG. 74 01' 33"

MAP SOURCE

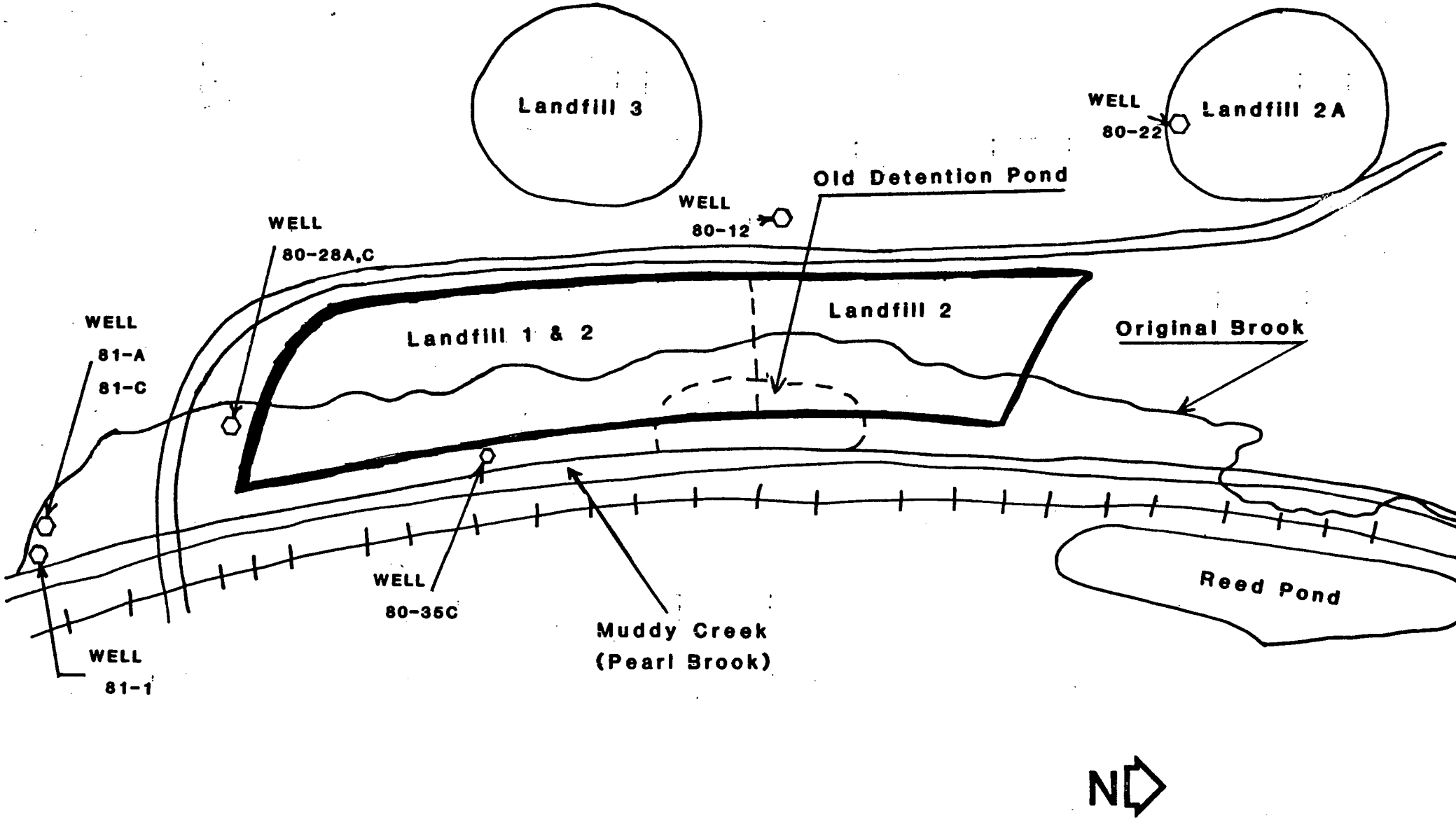
USGS MAP PARK RIDGE QUAD.

NEW YORK-ROCKLAND CTY.

7.5 MINUTE SERIES (1955)

Figure 2

LEDERLE LAB



2. PURPOSE

The Lederle Lab site is listed in the Registry of "Inactive Hazardous Waste Sites in New York State" as a landfill which started operation in the 1940's and may have received pharmaceutical waste.

The Phase I investigation at Lederle Lab provides a preliminary characterization of any hazardous substances at this site, establishes possible migration routes of pollutants, determines the population and resources which could be affected by pollutants from the site, investigates site operation and determines the party responsible for wastes at the site.

This Phase I investigation consists of the following:

A. The compilation of existing information about the site including:

   1) Records of site history from local, county, state and federal agencies.

   2) Information on site topography, geology, surface and groundwater and local demographics.

   3) Interviews of site operators and other individuals and parties with knowledge of the site.

B. The inspection of the site to:

   1) Observe current conditions.

   2) Verify information, where possible.

C. The review of all available data.

D. The preparation of a Phase I report containing:

1) A summary of findings.

2) The computation of a preliminary Hazard Ranking System (HRS) score.

3. SCOPE OF WORK

The Phase I investigation of the Lederle Lab site involved a site inspection by Gibbs & Hill, Inc., interviews and record searches.

The following individuals and agencies were contacted:

Contact	Information Received
Carlene D. Bassell, P.E. Richard Guterl, P.E. Lederle Laboratories Pearl River, NY 10965 (914) 735-5000	Interview/Files
Russell G. Slayback Leggette, Brashears & Graham, Inc. 72 Danbury Road Wilton, CT 06897	Interview/Files
George O'Keefe, P.E. Rockland County Department of Health Sanatorium Road Pomona, N Y 10970 (914) 354-0200, Ext. 2609	No Information
John Parnell Rockland County Department of Health Sanatorium Road Pomona, N Y 10970 (914) 354-0200, Ext. 2524	Interview/Files
Katherine Quinn Rockland County Department of Health Sanatorium Road Pomona, N Y 10970 (914) 354-0200, Ext. 2617	No Information

Contact	Information Received
Lawrence J. Alden Michael J. Komoroske Marsden Chen, P.E. Mark Moroukian N.Y. State Dept. of Environmental Conservation Bureau of Hazardous Site Control Div. of Solid and Hazardous Waste 50 Wolf Road Albany, N Y 12233-0001 (518) 457-0639	NYSDEC Files
Mark Moroukian N.Y. State Dept. of Environmental Conservation Bureau of Eastern Remedial Action Div. of Hazardous Waste Remediation 50 Wolf Road Albany, N Y 12233-0001 (518) 457-0639	NYSDEC Files
Ramanand Pergadia, P.E. James Hardy N.Y. State Dept. of Environmental Conservation Div. of Solid and Hazardous Waste 21 South Putt Corners Road New Paltz, N Y 12561 (914) 255-5453	NYSDEC Files
N.Y. State Department of Health Division of Environmental Protection Bureau of Public Water Supply Protection Empire State Plaza Corning Tower Building Albany, N Y 12237 (518) 457-4408	NYS Atlas of Community Water System Sources 1982
N.Y. State Dept. of Transportation 1220 Washington Ave. - Bldg. F Albany, N Y 12224	NYSDOT Quad Map
Bruno Nemikus USGS 5 Aerial Way Syosset, N.Y. (516) 938-8830	Published Info. on Geology, Topography, Groundwater, and Wells

Contact	Information Received
Fred Gilbert (State Soil Scientist) U.S. Dept. of Agriculture Soil Conservation Service U.S. Courthouse & Federal Bldg. 100 So. Clinton Street Syracuse, New York 13260 (315) 423-5521	County Soil Borings
Mr. Hennings Soil & Water Conservation District Orange County, NY (914) 343-1873	No Information
Eve Hoodleman Conservation District 23 New Hampstead Road New City, NY 10956 (914) 634-9242	No Information
Clauditte Tufau Rockland County Drainage Agency 23 New Hampstead Road New City, NY 10956 (914) 638-5083	No Information
Ben Conetta Environmental Protection Agency 26 Federal Plaza New York, NY (212) 264-6696	EPA ID No Info.
Town Clerk Town of Orange Town 26 Orange Burg Road Orange Burg, NY 10962 (914) 359-5100	No Information
Desimone Climent Highway Department 26 Orange Burg Road Orange Burg, NY 10962 (914) 359-5106	Recreational use of Muddy Creek within 3 miles downstream of site
Paul Trader, Horticultural Agent Cornell Cooperative Extension 62 Old Middletown Road New City, NY 10956	Irrigated and Agricultural Land Info.

4. SITE ASSESSMENT

4.1 Site History

Lederle Laboratories, a division of American Cyanamid Company, is located in Pearl River, Rockland County, New York (see Figure 1). Lederle produces a pharmaceutical and biological products. At this facility there are four landfills (see Figure 2). The landfills of concern, landfill 1 and 2, were operated from the 1920's up until 1979 and cover a 12 acre area. Landfill 2 was placed on top of landfill 1. The landfills have no liner and are in the groundwater table. Both landfills 2A and landfill 3, have appropriate liners and operate under New York State 6NYCRR Part 360.

Lederle Laboratories started as a horse farm in 1906. The facility concentrated on chemical processes until the 1950's when it moved into the biological industry including the manufacture of antibiotics and vitamins. Currently, Lederle Laboratories produces a full line of pharmaceutical and biological products and includes a large medical research facility.

The landfill area is located west of the laboratory complex. The Lederle landfill has been used since the 1920's [A-2.3.9]. A stream, now called Muddy Creek, originally flowed through the landfill site. Muddy Creek was relocated and now flows along the east side of the landfill area (see Figure 2). A small pond also existed at this location prior to landfilling [A-1, Photo #2]. Therefore, the landfill area is in the old stream bed. Photographs show the development of the site [A-1, Photo #1-4]. Records show that landfill 1 was closed in 1966. Landfill 2 was placed on top of landfill 1 and was active from 1966 to 1979 [A-3.7.12]. Landfill 2 also extended the site further north.

During operations, both landfills received incineration ash, glass debris, plant trash, paper, wood carboard, metal, vitamins,

wastewater treatment sludge, fermentation cake, and occasionally reactive and explosive chemicals. Landfill 1 also received solvents which were burned on site and acids which were neutralized, from 1946 to 1962 [A-3.1.12].

Inspections of the landfill by the Rockland Co. Dept. of Health show problems with grading and ponding [A-4]. In 1979, the landfill was researched for Senator Eckhart's subcommittee investigation. It was documented that heavy metals, nonpolar solvents, oils and oil sludges, alcohols, salts pharmaceutical wastes, paints and pigments and asbestos were disposed of in the landfill [A-5.1 & .2.5].

Eight groundwater monitoring wells (80-28 A&C, 80-12, 80-22, 80-35C [upgradient], 81-1, 81-A, 81-C [downgradient]) installed at and around the site indicate levels of heavy metals and phenols, exceeding 10NYCRR Part 703.5 in the groundwater [A-2, A-6 Figure 2]. The surface water is also monitored.

When the site was closed on September 1, 1979 [A-7], an estimated 677,800 tons of waste had been deposited since 1946 [A-5.1.5]. A November 1979 inspection by the Rockland County Health Department showed the landfill to be completed, capped and closed [A-8]. The site is presently covered by heavy vegetation and is completely fenced [A-1, Photo #5,6,7].

4.2 Site Topography

Two physiographic provinces, the Piedmont and the New England province are sharply defined topographic features in Rockland County. The northwestern or highland part of the county is underlain by crystalline rocks of the Reading Prong extension of the New England province. The lowland in the eastern part of the county is the north end of the Piedmont Lowland section of the Piedmont province. Lederle Laboratory is located in the Piedmont Lowland section. General topographic features in the site area are lowland ridges which range in elevation from 600 feet in the western part of the lowland to about 200 feet in the eastern

part. The valleys are incised as much as 150 to 200 feet below the crests of the ridges [A-9.2 & .3.11].

The site is located approximately 1.75 miles north of the New Jersey State line in Orangetown, adjacent to Muddy Creek, at the toe of the eastern slope of an unnamed hill. The site elevation is approximately 250 feet whereas the maximum elevation of the unnamed hill is 447 feet. The overall slope of the unnamed hill is 8 percent. The overall slope of the landfill is approximately 8 percent. The nearest river is Mudddy Creek which is adjacent to the site along its eastern boundary. The nearest naturally occurring lake is an unnamed lake located approximately 1 mile west of the site. The nearest freshwater wetland is located 2,500 feet south of site adjacent and downstream of Muddy Creek. Based on the 1955 revision of the USGS Park Ridge Quadrangle, an August 27, 1954, aerial photo and recent aerial photos of the site, an unnamed pond has been filled in, possibly a result of earlier landfilling operations.

4.3 Site Hydrogeology

The climate of Rockland County is the humid continental type, characteristic of the lower Hudson valley. Precipitation is abundant and, on the average, relatively evenly distributed throughout the year (see Table 4-1). The one year-24 hour rainfall is 2.75 inches. The mean annual lake evaporation is 31 inches and the mean annual rainfall is 50.8 inches. The resultant net annual precipitation is 19.8 inches.

TABLE 4-1

Monthly precipitation from composite records at Suffern and Spring Valley, N.Y., 1954-56

Month	Maximum (inches)	Minimum (inches)	Average (inches)
January	6.2	0.9	3.4
February	5.2	1.9	3.0
March	9.8	2.0	4.6
April	7.9	1.2	4.0
May	8.3	1.5	4.9
June	5.4	0.4	3.5
July	18.1	1.8	5.8
August	13.4	0.9	5.3
September	8.1	1.0	4.0
October	13.3	0.5	3.3
November	8.2	1.2	4.9
December	6.5	0.2	4.1
Total			50.8

Source: A-9, pg. 6.

Lederle Laboratory is located within the southeast quadrant of Rockland County, approximately 1.75 miles from the New Jersey state line. Triassic sandstone, shale, and conglomerate bedrock of the Triassic group form the basement geologic formation at the site having a maximum thickness of 10,000 feet. In general, the Triassic group is chiefly composed of non-marine red and brown sandstone, shale, and conglomerate. However, in the southeastern part of the county, the bedrock is chiefly composed of beds of gray and red sandstone and arkose with interbedded red shale [A-9.4.11].

The Triassic bedrock group is considered the principal aquifer of the area [A-9.5.11]. Water within this aquifer is principally stored in secondary porosity openings, such as

joints and bedding planes. Reported yields of wells on site (R065-80) range between 20 gpm and 265 gpm [A-9.10 & .11.11] Median yield of large diameter public supply wells is 300 gpm and median depth is 407 feet [A-9.6.11]. Depth to bedrock varies from 24 to 86 feet below ground surface [A-9.10 & .11.11].

Resting on top of bedrock is 24 to 86 feet of glacial till, stratified drift, and recent unconsolidated deposits. The Pleistocene till is composed of unstratified and unsorted compact clay, silt, sand, gravel, and boulders having a relatively low permeability (10^{-4} to 10^{-6} cm/sec). Yields from wells screened in the till average 2 to 3 gpm with a maximum of 5 gpm [A-9.7.11]. The Pleistocene stratified drift is composed of brown sand and gravel, and interbedded silt and clay. Locally, where deposits are chiefly sand and gravel, well yields vary from 8 to 1,700 gpm with median yields of 183 gpm for wells screened in the Pleistocene stratified drift (having a medium depth of 26 feet) [A-9.8.11]. Blanketing the site area are recent saturated alluvial deposits composed of brown sand and gravel, brown and gray silt and clay, and organic material. As a water bearing unit, recent alluvial deposits are reported as an unimportant aquifer owning to thickness and limited distribution [A-9.9.11]. Depth to groundwater, as reported, is variable (5-80 feet) based on data collected in 1957 [A-9.11.11]. However, because of the apparent filling in of the unnamed pond, portions of the landfills are within the water table. Groundwater flow is southeast towards Muddy Creek [A-10]. For synopsis of the geologic units in Rockland County refer to A-9 (Table 3) and to Table 4-2 for a well log of well number RO72, located within the site.

The aquifer of concern is the Triassic bedrock aquifer. The secondary aquifer is the water table aquifer. Published data [A-9, Plate 1] illustrates that over 90 percent of the boreholes and wells were drilled into bedrock. Because of the presence of low permeable till 10^{-4} to 10^{-6} cm/sec. at the site (see Table

4-2) and possible stratified layers of silt and clay, the interconnection or recharge between the water table aquifer in the unconsolidated material and the bedrock aquifer is impeded. The permeability of the 6-foot layer of stratified sand and gravel could vary from 10^{-2} to 10^{-4} cm/sec. [Fetter, Applied Hydrogeology pg. 75].

Table 4-2
Logs of selected wells and test boring in Rockland County

Ro 72; 16X, 12.1S, 1.2W; Lederle Laboratories; well H; Pearl River; drilled by Layne-New York Co., Inc.; altitude of land surface 248 feet; log supplied by M.E. Johnson

	Thickness (feet)	Depth (feet)
Pleistocene:		
No record	6	6
Sand and gravel	6	12
Sand, clayey, yellow; sand and gravel; some beds of clay	74	86
Triassic:		
Newark group:		
Shale, red	6	92
Shale, red; conglomeratic sandstone	45	137
Sandstone, pink	63	200
Sandstone, pink; some conglomerate	19	219
Sandstone, pink; some shale	16	235
Conglomerate, sandstone, and shale; pink; interbedded	56	291

Source: Reference A-9, pg. 62.

4.4 Site Contamination

Waste Types and Quantities

EPA Land Disposal forms for landfills, surface impoundments and/or waste piles indicate that the following materials were disposed in the landfills (solvents were incinerated, acids were neutralized [A-3.1 & .7.12]:

	Landfill 1 (1946-66)	Landfill 2 (1966-79)
Incinerator ash glass debris plant trash (paper, wood, cardboard, metal) vitamins wastewater treatment sludge fermentation cake	4450 cu.yd/yr compacted volume	12000 cu.yd/yr compacted volume
solvents (incinerated)	12500 gal/yr (1946-1962)	-
acids (treated/neutralized)	60 gal/yr (1946-1962)	-
reactive/explosive chemicals	"occasionally"	"occasionally"

At the site, solvents were placed in an open pit and burned, acids were placed in an acid pit and neutralized with limestone and occasionally chemicals were detonated and/or burned at the site [A-3.1 & .7.12].

In response to an inquiry by the Subcommittee on Oversight and Investigations, in April 1979, Lederle prepared documents which identified the components of process waste deposited at the facility. The 677,800 tons of waste generated from 1946-1979 were landfilled as mixed industrial waste, drummed waste, incinerator ash, and in an acid pit. The waste composition was identified as follows [A-5]:

Heavy and trace metals
- mercury
- lead
- arsenic or selenium or antimony
- iron or manganese or magnesium
- zinc or cadmium or copper or trivalent chromium

Organics

nonpolar solvents other than
trichloroethylene
carbontetrachloride

oils and/or oil sludges
alcohols
possibly esters and ethers

Inorganics

salts

Pharmaceutical wastes
Paints and pigments
Asbestos

Groundwater

Sampling data from on site monitoring wells (80-28 A and C, 80-12, 80-22, 80-35C [upgradient], 81-1, 81-A, 81-C [downgradient]) has shown concentrations of contaminants exceeding NYS Water Quality Standards for Class GA waters. The landfills have no liner and are in the groundwater table [A-1, Photo 2&4 (pond filled in), A-10, A-9.11.11, B-4].

In February 1981, as part of NYS DEC "Project Winter" [A-11] and in June 1981, for landfill 2A and 3 applications [A-2], groundwater samples showed the following contamination at or above water quality standards:

	Upgradient	Downgradient	10NYCRR Part 703.5
Iron	1.4 mg/l	190 mg/l	0.3 mg/l
Manganese	0.26	12	0.3
Chromium	0.004	0.064	0.05
Barium	<0.1	1.1	1.0
Lead	<0.04	0.05	0.05
Mercury	No sample	0.0045	0.002

	Upgradient	Downgradient	10NYCRR Part 703.5
Phenols	No sample	0.042	0.001
Cyanide	No sample	0.126	0.1

Recent groundwater samples in 1985 [A-2] and 1987 [A-13] showed the following levels of contamination exceeding water quality standards:

	Upgradient	Downgradient	10NYCRR Part 703.5
Mercury	0.00034	0.014	0.002
Zinc	0.01	2.74	0.3
Phenols	0.028	<0.01	0.001

Surface Water

Sampling data from Muddy Creek (Pearl Brook) is only available downstream of the site. Data collected in 1985 phenol contamination exceeding NYS water quality standards for drinking water. However, there are no drinking water intakes within 3 miles downstream of the site [A-2]. More recent samples did not show phenol contamination above the detection limit of 0.01 mg/l [A-12.3.19].

Soil

No data available.

Air

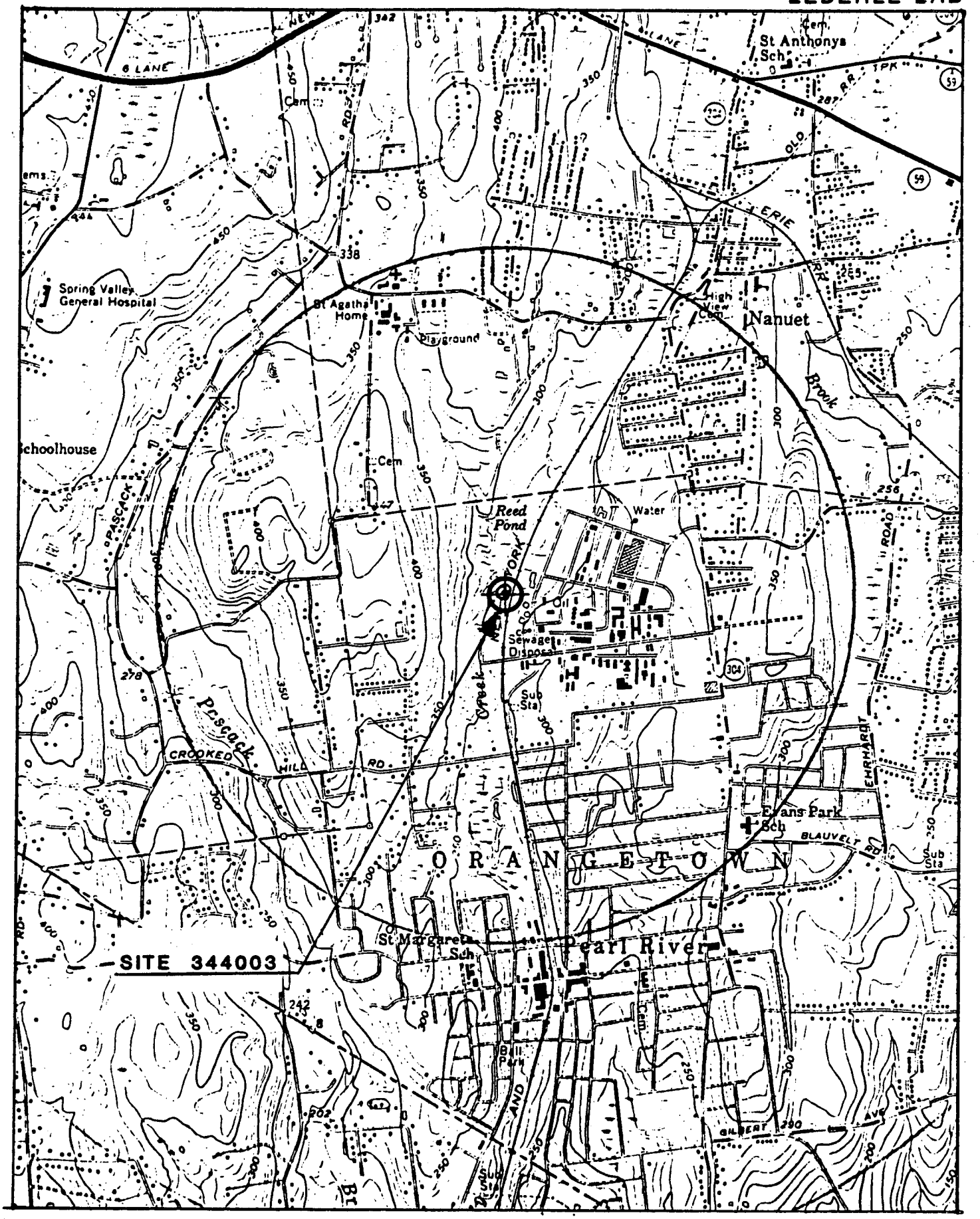
No data available.

The Fire and Explosion HRS score, 27.71, is based on the ignitability of oil, the reactivity of "explosive/reactive" chemicals, and the incompatibility of alcohols and lime neutralized acids dumped at the site. Direct contact with hazardous wastes at the site is highly unlikely due to security measures employed by the owner. Accessibility for the site was scored a zero resulting in an HRS Direct Contact score of zero.

5.2 Location

Figure 1

LEDERLE LAB



N

COORDINATES:

LAT. 41° 04' 30"

LONG. 74° 01' 33"

MAP SOURCE

USGS MAP PARK RIDGE QUAD.

NEW YORK-ROCKLAND CTY.

7.5 MINUTE SERIES (1955)

5.3 HRS Worksheets

Facility name: Lederle Lab

Location: Pearl River, New York

EPA Region: II

Person(s) in charge of the facility: Carlene Bassell, P. E.
Manager Environmental
Technology

Name of Reviewer: T. Propersi Date: 10/30/87

General description of the facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

The site was an active landfill from the 1920's to 9/1/79. The landfill, owned and operated by Lederle Labs, received the following wastes: heavy and trace meatals, nonpolar solvants, oils and oil sludges, alcohols, salts and pharmaceutical wastes, paints and pigments and asbestos. From 1946 to 1979, 675,000 tons of waste were disposed of the 12 acre site.

Scores: $S_M = 35.37$ ($S_{gw} = 61.15$ $S_{sw} = 2.30$ $S_a = 0$)

$S_{FE} = 27.71$

$S_{DC} = 0$

FIGURE 1
HRS COVER SHEET

Ground Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 (45)	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 (3)	2	6	6	
Net Precipitation	0 1 2 (3)	1	3	3	
Permeability of the Unsaturated Zone	0 1 (2) 3	1	2	3	
Physical State	0 1 2 (3)	1	3	3	
Total Route Characteristics Score			14	15	
3 Containment	0 1 2 (3)	1	3	3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 (18) ✓	1	18 ✓	18	
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8	
Total Waste Characteristics Score			19	26	
5 Targets					3.5
Ground Water Use	0 1 (2) 3	3	6	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 / 12 16 18 20 / 24 30 32 (35) 40	1	35	40	
Total Targets Score			41	49	
6 If line 1 is 45, multiply 1 x 4 x 5 / If line 1 is 0, multiply 2 x 3 x 4 x 5			35055	57,330	
7 Divide line 6 by 57,330 and multiply by 100	$S_{gw} = 61.15$				

3739

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet							
Rating Factor	Assigned Value (Circle One)		Multi-plier	Score	Max. Score	Ref. (Section)	Max. Score
1 Observed Release	(0)	45	1	0	45	4.1	45
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.							
2 Route Characteristics						4.2	
Facility Slope and Intervening Terrain	0 1 (2) 3		1	2	3		
1-yr. 24-hr. Rainfall	0 1 (2) 3		1	2	3		
Distance to Nearest Surface Water	0 1 2 (3)		2	6	6		
Physical State	0 1 2 (3)		1	3	3		
Total Route Characteristics Score				13	15		
3 Containment	0 1 2 (3)		1	3	3	4.3	
4 Waste Characteristics						4.4	
Toxicity/Persistence	0 3 6 9 12 15 (18)		1	18	18		
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8		1	1	8		
Total Waste Characteristics Score				19	26		19
5 Targets						4.5	
Surface Water Use	(0) 1 2 3		3	0	9		
Distance to a Sensitive Environment	0 (1) 2 3		2	2	6		
Population Served/Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40		1	0	40		
Total Targets Score				2	55		2
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				1482	64,350		1710
7 Divide line 6 by 64,350 and multiply by 100			S_{sw} = 2.30				2.65

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

7.02

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
[1] Observed Release	(0) 45	1	0	45	5.1
Date and Location: No Samples Taken					
Sampling Protocol: No Samples Taken					
If line [1] is 0, the S_a = 0. Enter on line [5]. If line [1] is 45, then proceed to line [2].					
[2] Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 (3)	1	3	3	
Toxicity	0 1 2 (3)	3	9	9	
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8	
	Total Waste Characteristics Score		13	20	
[3] Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 (24) 27 30	1	24	30	
Distance to Sensitive Environment	0 1 (2) 3	2	4	6	
Land Use	0 1 2 (3)	1	3	3	
	Total Targets Score		31	39	
[4] Multiply [1] x [2] x [3]			0	35,100	
[5] Divide line [4] by 35,100 and multiply by 100		S_a =	0		

FIGURE 9
AIR ROUTE WORK SHEET

	S	S^2
Groundwater Route Score (S_{gw})	61.15	3739.32
Surface Water Route Score (S_{sw})	2.30	5.29
Air Route Score (S_a)	0.0	0.0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		3744.61
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		61.19
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} \,/\, 1.73 = S_M =$		35.37

FIGURE 10
WORKSHEET FOR COMPUTING S_M

Fire and Explosion Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Containment	1 (3)	1	3	3	7.1
2 Waste Characteristics					7.2
Direct Evidence	(0) 3	1	0	3	
Ignitability	0 1 (2) 3	1	2	3	
Reactivity	0 1 2 (3)	1	3	3	
Incompatibility	0 (1) 2 3	1	1	3	
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8	
Total Waste Characteristics Score			7	20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 (3) 4 5	1	3	5	
Distance to Nearest Building	0 (1) 2 3	1	1	3	
Distance to Sensitive Environment	0 1 (2) 3	1	2	3	
Land Use	0 1 2 (3)	1	3	3	
Population Within 2-Mile Radius	0 1 2 3 4 (5)	1	5	5	
Buildings Within 2-Mile Radius	0 1 2 3 4 (5)	1	5	5	
Total Targets Score			19	24	
4 Multiply 1 x 2 x 3			399	1,440	
5 Divide line 4 by 1,440 and multiply by 100		S_{FE} =	27.71		

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Incident	(0) 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	(0) 1 2 3	1	0	3	8.2
3 Containment	(0) 15	1	0	15	8.3
4 Waste Characteristics Toxicity	0 1 2 (3)	5	15	15	8.4
5 Targets					8.5
Population Within a 1-Mile Radius	0 1 2 3 4 (5)	4	20	20	
Distance to a Critical Habitat	(0) 1 2 3	4	0	12	
Total Targets Score			20	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			0	21,600	
7 Divide line 6 by 21,600 and multiply by 100		S_{DC} =	0		

FIGURE 12
DIRECT CONTACT WORK SHEET

5. PRELIMINARY HRS

5.1 Narrative Summary

The site received the following preliminary HRS scores: Groundwater (Sgw) 61.15, Surface Water (Ssw) 2.30, Direct Contact (Sdc) 0. No score could be determined for Air Route migration due to the lack of sampling data. Fire and Explosion (Sfe) received a score of 27.71 based on "reactive/explosive" chemicals dumped at the site.

The high score for groundwater migration is the result of a very large target population and the presence of a highly toxic and persistent material. More than one-quarter of a million persons within three miles of the site are potential targets with respect to groundwater contamination. The aquifer of concern, which is in direct contact with the lowest point of the landfill, has been shown to have levels of mercury exceeding NYS water quality standards. Documents indicate that mercury, and other heavy metals, have been dumped at the site. However, the existing quantities of these hazardous materials are not known.

The site is bordered on one side by Muddy Creek (also known as Pearl Creek). Available NYSDEC inspection reports for the site since 1979 indicate that leachate has not been entering surface water. Although phenols have been found in significant concentrations in Muddy Creek, the surface water score for the site is 2.30. The waters of the creek are not used within three miles downstream of the site.

The air route migration score for the site could not be determined due to a lack of sampling data. However, airborne contaminants at the site are unlikely due to the nature of the wastes and the presence of an adequate landfill cover.

5.4 HRS Documentation

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference. Include the location of the document.

FACILITY NAME: Lederle Laboratories

LOCATION: Pearl River, NY

DATE SCORED: 10/30/87

PERSON SCORING: Propersi

PRIMARY SOURCE(S) OF INFORMATION (e.g. EPA region, FIT, etc.):

Site visit, site interview, NYSDEC files, owner files.

FACTORS NOT SCORED DUE TO INSUFFICIENT INFORMATION:

Sa - no sampling data available.

COMMENTS OR QUALIFICATIONS:

Documentation regarding the landfill of concern indicates that oils and waste containing heavy metals was disposed of at the site. Of the 677,800 tons of waste landfilled between 1946 and 1979, it is not known, specifically, what portion was hazardous. Tests of groundwater from monitoring wells downgradient of the site indicate the presence of mercury, other metals and phenols in concentrations exceedong NYS water quality standards.

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

Manganese, Mercury, Phenol, Chromium, Cyanide. [8]
Score = 45

Rationale for attributing the contaminants to the facility:

Upgradient samples contained lower concentrations than the downgradient samples. [2,8]

* * *

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) of concern:

Triassic Bedrock Aquifer. [1.4.11]

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

Zero to five feet [A-1, Photo #2&4 (pond filled in); A-10, A-9.11.11, B-4].

Depth from the ground surface to the lowest point of waste disposal/storage:

Not known.
Score = 6

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

50.8 inches [2]

Mean annual lake or seasonal evaporation (list months for seasonal):

31 inches [2]

Net precipitation (subtract the above figures):

19.8 inches
Score = 3

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Clay silt and gravel. [1.9.11]

Permeability associated with soil type:

10^{-4} to 10^{-6} cm/sec. [2]
Score = 2

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

Incinerator ash, solids, sludge, liquid. [7.1. & 7.12]
Score = 3

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

No containment. Site is covered but no liner or leachate control system. [7.2 & 8.12].

Method with highest score:

No containment. [7.2 & 8.12]
Score = 3

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated: [2,3]

Mercury, iron, manganese and lead.

Compound with highest score:

Mercury.
Mercury Score = 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

Not known.

Basis of estimating and/or computing waste quantity:

Assume minimum, non-zero score.
Score = 1

* * *

5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Drinking water.
Score = 6

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

East of the site.

Distance to above well or building:

0.95 miles. [4]

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

√11 Community wells serving 227,900 persons (includes wells beyond 3-mile radius to account for mixing of water by supplier) and 70 persons from well #23 [4].

Private wells - 12,571 [Based on 3,308 wells, Ref. 11]

Computation of Land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

N/A [10]

Total population served by ground water within a 3-mile radius:

240,541 persons.
Matrix Score = 35

SURFACE WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

No release observed. Data is insufficient to attribute release to surface water.

Rationale for attributing the contaminants to the facility:

N/A
Score = 0

* * *

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

8 percent. [5]

Name/description of nearest downslope surface water:

Muddy Creek. [5]

Average slope of terrain between facility and above-cited surface water body in percent:

8 percent. [4]

Is the facility located either totally or partially in surface water?

No.

Is the facility completely surrounded by areas of higher elevation?

No. [5]
Score = 2

1-Year 24-Hour Rainfall in Inches

2.75 inches. [2]
Score = 2

Distance to Nearest Downslope Surface Water

50 feet. [5]
Score = 6

Physical State of Waste

Incinerator ash, solids, sludge, liquid. [7.1 & 7.12]
Score =3

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

No containment. [7.2 & 8.12]

Method with highest score:

No containment. [7.2 & 8.12
Score = 3

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated: [2,3]

Mercury, iron, manganese and lead.

Compound with highest score:

Mercury.
Matrix Score = 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

Not known.

Basis of estimating and/or computing waste quantity:

Assume minimum, non-zero score.
Score = 1

* * *

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Not currently used. [9]
Score = 0

Is there tidal influence?

No.

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

N/A

Distance to 5-acre (minimum) fresh-water wetland, if 1 miles or less:

<1 mile south of site. Wooded wetland.
Score = 2

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

Not within one mile.

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substances and population served by each intake:

None.

Computation of Land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

None.

Total population served:

None.

Name/description of nearest of above water bodies:

N/A

Distance to above-cited intakes, measured in stream miles.

N/A
Score = 0

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

No observed release.
Score = 0

Date and location of detection of contaminants

N/A

Methods used to detect the contaminants:

N/A

Rationale for attributing the contaminants to the site:

N/A

* * *

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Not known. However, "reactive/explosive chemicals from laboratories" were "occasionally" disposed of at the site.

Most incompatible pair of compounds:

Alcohols and lime neutralized acids.
Score = 3

Toxicity

Most toxic compound:

Mercury
Matrix Score = 9

Hazardous Waste Quantity

Total quantity of hazardous waste:

Not known.

Basis of estimating and/or computing waste quantity:

Assume minimum, non-zero score.
Score = 1

* * *

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi | 0 to 1 mi | 0 mi to 1/2 mi | 0 to 1/4 mi

19,269 persons (based on 3.8 persons per dwelling for 597 dwellings [5] and 100 percent of the population of the City of Middletown; 17,000).

Score = 24

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

N/A

Distance to 5-acre (minimal) fresh-water wetland, if 1 mile or less:

<1 mile south of site. Wooded wetland.
Score = 4

Distance to critical habitat of an endangered species, if 1 mile or less:

Not within one mile.

Land Use

Distance to commercial/industrial area, if 1 mile or less:

0.11 miles. [5]

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

N/A

Distance to residential area, if 2 miles or less:

0.33 miles. [5]

Distance to agricultural land in production within past 5 years, if 1 mile or less:

N/A [10]

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

N/A [10]

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within the view of the site?

Score = 3

FIRE AND EXPLOSION

1 CONTAINMENT

Hazardous substances present:

Mercury and oils. In addition, "reactive/explosive chemicals from laboratories" were "occasionally" disposed of at the site. [7]

Type of containment, if applicable:

Landfill cover with heavy vegetation.

Score = 3

* * *

2 WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

No measurements taken.
Score = 0

Ignitability

Compound used:

Oil
Score = 2

Reactivity

Most reactive compound:

Not known. However, "reactive/explosive chemicals from laboratories" were "occasionally" disposed of at the site.

Score = 3

Incompatibility

Most incompatible pair of compounds:

Alcohols and lime neutralized acid.
Score = 1

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

None.

Basis of estimating and/or computing waste quantity:

Assume minimum, non-zero score.
Score = 1

* * *

3 TARGETS

Distance to Nearest Population

0.11 miles. [5]
Score = 3

Distance to Nearest Building

0.11 miles. [5]
Score = 1

Distance to Sensitive Environment

Distance to wetlands:

<1 mile south of site. Wooded wetland.
Score = 2

Distance to critical habitat:

Not within one mile.

Land Use

Distance to commercial/industrial area, if 1 mile or less:

0.11 miles. [5]
Score = 3

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

N/A

Distance to residential area, if 2 miles or less:

0.33 miles. [4]

Distance to agricultural land in production within past 5 years, if 1 mile or less:

N/A [10]

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

N/A [10]

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within the view of the site?

No.

Population Within 2-Mile Radius

More than 58,000 persons (based on 3.8 persons per dwelling for 2,233 dwellings [5] and 33 percent of the population of Montvale, NJ and the entire city of Orangetown). [House Count Detail See 11].

Buildings Within 2-Mile Radius

More than 15,000 buildings (3.8 persons per dwelling and 58,000 persons).

Score = 5

DIRECT CONTACT

1 OBSERVED INCIDENT

Date, location, and pertinent details of incident:

No incident observed.
Score = 0

* * *

2 ACCESSIBILITY

Describe type of barrier(s):

Both the landfill and the perimeter of the facility are fenced.
Score = 0

* * *

3 CONTAINMENT

Type of containment, if applicable:

Landfill cover with heavy vegetation.
Score = 0

* * *

4 WASTE CHARACTERISTICS

<u>Toxicity</u>

Compound(s) evaluated:

Mercury, iron, manganese and lead.

Compound with highest score:

Mercury.
Matrix Score = 15

5 TARGETS

Population within one-mile radius

19,269 persons (based on 3.8 persons per dwelling for 597 dwellings [5] and 100 percent of the population of the City of Middletown; 17,000). [House Count Detail: Ref. 11]

Matrix score = 20

Distance to critical habitat (of endangered species)

Not within one mile.

REFERENCES

If the entire reference is not available for public review in the EPA regional files on this site, indicate where the reference may be found:

Reference Number	Description of Reference
1	Perlmuter, N., Geology and Groundwater Resources of Rockland County, N.Y., USGS Bulletin GW-42, 1959, pp.
2	Uncontrolled Hazardous Waste Site Ranking System; A Users Manual, USEPA, 1984.
3	Sax, Irving, Dangerous Properties of Industrial Materials (New York, Van Norstrand Reinhold Co.), 1979.
4	New York State Atlas of Community Water System Sources, New York State Department of Health, 1982.
5	Park Ridge, NJ-NY Quadrangle Map, United States Department of the Interior Geological Survey, 1955.
6	Thomas J. Reilly (Lederle Lab.) Letter to Richard Gardineer (NYSDEC), 10/30/81.
7	Land Disposal, Landfills, Surface Impoundments and/or Waste Piles, Lederle Lab.
8	Carlene Bassell (Lederle Lab.) Leter to Ramanand Pargardia (NYSDEC), 10/3/85.
9	Telephone Conversation with Climent Destimore, (Highway Dept., Town of Orangetown).
10	Telephone Conversation with Paul Trader (Cornell Co-operative Extension, Rockland County).
11	USGS House Count.

STATE OF NEW YORK

DEPARTMENT OF CONSERVATION

WATER POWER AND CONTROL COMMISSION

Geology and Ground-Water Resources of Rockland County, New York

With Special Emphasis on the Newark Group (Triassic)

By

NATHANIEL M. PERLMUTTER

Geologist, U. S. Geological Survey

Prepared by the

U. S. GEOLOGICAL SURVEY

in cooperation with the

NEW YORK WATER POWER AND CONTROL COMMISSION

BULLETIN GW-42

ALBANY, N. Y.

1959

Topography and Drainage

Two physiographic provinces, the Piedmont province and the New England province (Fenneman, 1938, p. 145–152 and 368–370) are sharply defined topographically in Rockland County. The northwestern or highland part of the county is underlain by crystalline rocks of the Reading Prong extension of the New England province. The part of the highland near the New York-New Jersey boundary commonly is referred to as the Ramapo Mountains and the part near the Hudson River is referred to as the Hudson Highlands. The surface of the upland is rolling and has relatively low relief except in the deep gorges of the Ramapo and Hudson Rivers. The summits are generally at altitudes of 1,100 to 1,200 feet, and the maximum altitude is about 1,300 feet. The eastern face of the upland is a steep escarpment that overlooks a broad lowland to the east.

The lowland in the eastern part of the county is the north end of the Piedmont Lowland section of the Piedmont province. The bedrock consists chiefly of gently-dipping beds of relatively soft sedimentary rocks that have been eroded to form a series of low, northerly-trending ridges separated by narrow valleys. Summit levels on the ridges range in altitude from about 600 feet in the western part of the lowland to about 200 feet in the eastern part. The valleys are incised as much as 150 to 200 feet

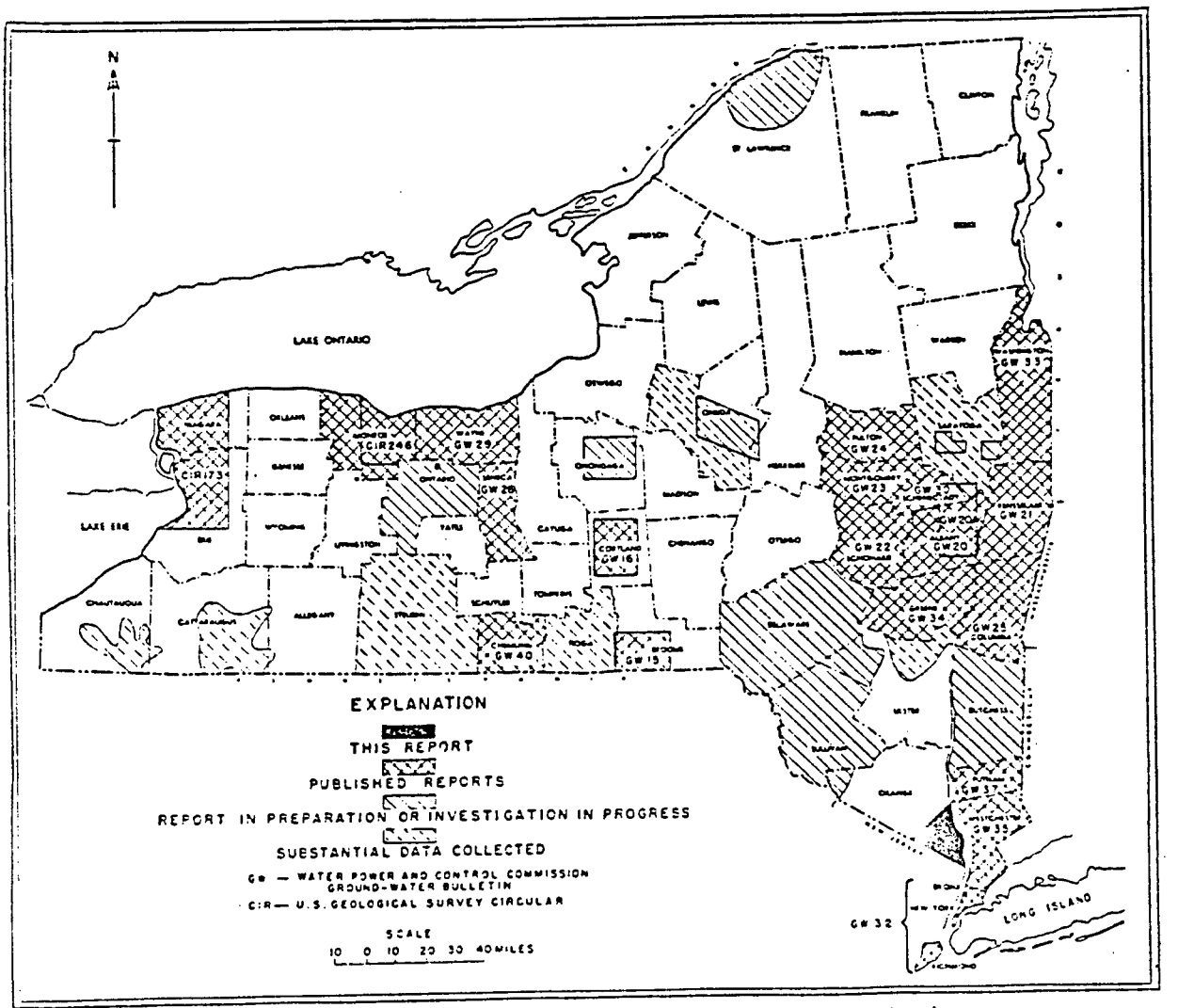


Figure 1.—Index map of New York showing status of ground-water investigations in 1959 and location of Rockland County.

below the crests of the ridges. The eastern slopes of the ridges are somewhat steeper than the western slopes owing to the westerly dip of the beds.

A well-defined ridge of diabase rises above the lowland in eastern Rockland County and roughly follows the trend of the Hudson River as far north as Haverstraw where it curves to the west and terminates several miles from the river. The ridge ranges in width from about 0.5 to 1 mile and in altitude from about 200 feet at the south end to 832 feet near the north end at High Tor, a prominent point just south of Haverstraw. Summit levels on the diabase ridge are about 600 to 700 feet above sea level. The eastern face of the ridge is nearly vertical and in many places the rock is broken along vertical joint planes forming a series of hexagonal columns. The western slope of the ridge is gentle at some places and steep at others. The ridge is cut by several narrow valleys called cloves and by a wide gorge near Piermont through which Sparkill Creek flows east to the Hudson River.

The streams in Rockland County are tributary to the Hudson River, Hackensack River, and Passaic River. In general streams flowing northerly and easterly discharge into the Hudson River, streams flowing southwesterly discharge into the Passaic River, and those flowing southerly discharge into the Hackensack River.

The Hudson River, which forms the boundary between Rockland County and Westchester County, is the largest stream in the area. The river is estuarine in character and the water level has a normal tidal range of about 3 feet in the vicinity of Rockland County. The depth to the river bottom is generally less than 15 feet but in the main channel in the northern part of the county it is more than 100 feet deep in several places. The valley of the Hudson is markedly constricted at the northern and southern extremities of the county and is widest opposite Haverstraw (pl. 1).

Aside from the Hudson River there are 8 other principal streams in the county (pl. 3). The names of the streams and the area of their drainage basins in Rockland County are given in the table below. Of these streams the three largest are the Hackensack River, the Ramapo River, and the Mahwah River.

Principal drainage basins of Rockland County

Name of stream	Area of drainage basin in Rockland County (square miles)
Cedar Pond Brook	14.5
Hackensack River (above dam on Lake DeForest)	27.0
Hackensack River (below dam on Lake DeForest)	23.5
Mahwah River	21.5
Minisceongo Creek	18.9
Pascack Brook	12.3
Ramapo River	26.1
Saddle River	8.0
Sparkill Creek	8.1

The Hackensack River drains an area of about 48 square miles in eastern Rockland County. The discharge from the northern part of the watershed drains into Lake DeForest Reservoir which is controlled by a dam at West Nyack. The reservoir is about 4 miles long, 0.25 to 0.5 mile wide, and has an area of about 1,020 acres. The storage capacity is about 5.6 billion gallons at a water surface of

Table 3.—Geologic units in Rockland County, N. Y., and their water-bearing properties

Class	Age	Geologic unit	Maximum thickness (feet)	Geologic properties	Water-bearing properties
Unconsolidated deposits	Recent	Recent deposits	100±	Chiefly stream and lake deposits composed of brown sand and gravel, brown and gray silt and clay, and organic material. Includes estuarine deposits of silt and clay beneath Hudson River as much as 100 feet thick.	Unimportant as an aquifer owing to thinness and limited distribution. No records of wells obtained.
	Pleistocene	Stratified drift	600±	Stratified brown sand and gravel and interbedded silt and clay, generally less than 100 feet thick; in some places consists mainly of brown and gray varved clay and silt. Thickest deposits in the buried channel of the Hudson River.	Important aquifer locally where deposits are composed of sand and gravel. Yields range from 8 to 1,700 gpm; median yield is 183 gpm; median depth of wells is 20 feet and range is 5 to 170 feet. Layers of silt and clay retard movement of water and cause artesian conditions locally. Water is generally soft to moderately hard. Contaminated by salty water locally along Hudson River shore.
		Till	300±	Unstratified, poorly sorted brown and grayish-brown sand, gravel, boulders, silt, and clay. Occurs principally on hills and in the smaller valleys.	Low permeability. Few records of wells available. Yields average 2 to 3 gpm, mainly from dug wells less than 25 feet deep.
	—Unconformity—				
Consolidated rocks (bedrock)	Late Triassic	Palisade diabase and minor bodies of igneous rocks	1,000±	Gray and black fine- to coarse-grained diabase intruded as sill or dike; crops out in prominent ridge in eastern part of county. Minor dikes and plugs of diabase in small scattered bodies. Dark gray, fine-grained, body of vesicular igneous rock in western part of county, probably a basaltic flow.	Low porosity and permeability; water occurs in openings along joints and irregular fractures. Median yield of wells is 5 gpm and median depth is 188 feet.
		Newark group (Includes Brunswick and Stockton formations)	10,000±	Chiefly beds of non-marine red and brown sandstone, shale, and conglomerate; in southeastern part of area chiefly beds of gray and red sandstone and arkose with interbedded red shale.	Principal aquifer, low primary porosity; water occurs chiefly in openings along joints and bedding planes. Yields of wells range from 3 gpm to 1,500 gpm. Median yield of large-diameter public-supply wells is 300 gpm and median depth is 407 feet. Water generally is moderately hard.
	—Unconformity—				
	Cambrian and Ordovician	Cambrian and Ordovician rocks	Unknown	Undifferentiated rocks of limited areal extent. Consist of gray and tan quartzite, gray and blue dolomite and limestone, and dark gray shale and phyllite. Beds are steeply inclined.	Unimportant as an aquifer. Water occurs in openings along joints, bedding planes, and irregular fractures. Median yield of wells is 9 gpm and median depth is 130 feet. Water moderately hard to hard.
	—Unconformity—				
	Precambrian	Precambrian rocks (Includes equivalents of the Byram gneiss, Losee gneiss, Storm King granite, Peekskill diorite, and Grenville meta-sediments, and some undifferentiated igneous rocks of uncertain age)	Unknown	Gray and pink granite, gneiss, schist, and undifferentiated basic rocks. Rocks closely folded and broken by several major faults; widely exposed.	Minor aquifer. Water contained in openings along joints and irregular fractures. Median yield of wells is 12 gpm and median depth is 105 feet.

The amount of water stored in rocks depends on the porosity or the volume of pore space, which is commonly expressed as a percentage of the total volume of the rock. There are two types of porosity, primary and secondary. Primary porosity is that due to the presence of original openings that came into existence at the time the the rocks were formed. Secondary porosity is that due to openings that formed after the rocks were consolidated. The porosity of unconsolidated deposits is of the primary type and is due almost entirely to the presence of interstices between the constitutent grains. The porosity of consolidated rocks, on the other hand, is mainly of the secondary type and is due chiefly to the presence of openings developed along joints, faults, and other fractures. Consolidated rocks, such as some beds of sandstone and conglomerate, may also have substantial primary porosity. The porosity of beds of well-sorted sand or gravel generally ranges from 25 to 35 percent. In consolidated sedimentary rocks such as those of the Newark group in Rockland County the primary porosity ranges from about 1 to 21 percent (table 5); the secondary porosity is not known. Pore spaces in some rocks may be numerous but very small and poorly interconnected. The permeability of such rocks is low and they do not yield water readily to wells. The permeability is a measure of the capacity of rocks to transmit water. It can be expressed as the number of gallons of water per day that flows through a section of aquifer (water-bearing unit) one foot wide and one foot thick, oriented at right angles to the direction of flow, and under a hydraulic gradient of one foot per foot. The permeability of the rocks in Rockland County ranges from almost zero in parts of the bedrock to an estimated 500 to 1,000 gpd per square foot in stratified sand and gravel.

Under natural conditions, the rate of recharge is balanced by the discharge, except for temporary differences due to changes in the amount of water stored in the aquifer. Withdrawal of water from a well creates a cone of depression in the water level. As the withdrawal continues, the cone of depression deepens and broadens until a balance is reached between recharge, natural discharge, and the withdrawal. When this balance is reached, the water level in the well stabilizes and the cone of depression ceases to expand.

The water-bearing deposits of Rockland County are classified as: (1) consolidated rocks and (2) unconsolidated deposits. The yields and depths of wells penetrating the principal water-bearing units are summarized in table 4 and the geologic and water-bearing characteristics of the principal sources of ground water are described in the following sections.

Ground Water in Consolidated Rocks

The consolidated rocks are the chief source of water in Rockland County. The principal units from oldest to youngest are: (1) Precambrian rocks, (2) Cambrian and Ordovician rocks, (3) Newark group, and (4) Palisade diabase and associated igneous rocks of Triassic age. Of these units, the rocks of the Newark group constitute the principal aquifer.

PRECAMBRIAN ROCKS

Geologic Properties

Crystalline rocks of Precambrian age crop out in a northeast-trending belt of about 70 square miles in the northwestern part of the county (pl. 2). They also form the deeply buried basement beneath the rocks of Triassic age in the eastern part of the county. The crystalline rocks consist predominantly of gray and pink fine- to coarse-grained granite, and gray banded coarse-grained gneiss, and include some dark-colored schist, diorite, ultra-basic igneous rocks, marble, and thin dikes of diabase. Nearly all these crystalline rocks are thought to be of Precambrian age except a few small bodies of ultra-basic igneous rocks such as those of the Cortlandt series which crop out at and near Stony Point and some scattered diabase dikes which are probably younger in age but which have been included with the Precambrian rocks on plate 2 for convenience. The crystalline rocks are intensely folded and faulted and are broken into irregular blocks by joints and other fractures. The openings are generally widest and most numerous near the surface.

1·6·11

Table 4.—Comparison of yields and depths of wells in relation to the geologic source of the water

Geologic unit	Yield (gpm)				Depth (feet)			
	No. of wells	Median	Range		No. of wells	Median	Range	
			Low	High			Low	High
Stratified drift	18	183	8	1,500	26	26	5	170
Newark group								
All wells	265	30	3	1,515	337	165	13	805
* Public-supply wells	25	300	150	1,515	25	407	247	655
Palisade diabase	10	5	2	16	12	188	72	770
Cambrian and Ordovician rocks	7	9	3	30	9	130	34	345
Precambrian rocks	32	12	0	180	52	105	25	640

* Production wells of Spring Valley Water Works and Supply Co. Yield of wells based on data from initial pumping tests.

The crystalline bedrock is fresh to only slightly weathered because glaciers scoured the surface and removed soft and highly weathered material during Pleistocene time. Since the end of the Pleistocene epoch a small amount of chemical weathering has taken place along some faults and joints, and at the contacts between the bedrock and the overlying unconsolidated deposits. Major irregularities on the bedrock surface are of preglacial origin and are due mainly to weathering and erosion of the rock along fault zones and joints and to erosion of belts of relatively soft rock by streams. Some preglacial physiographic features were etched out in sharper relief by glacial erosion. The Precambrian rocks are treated as a single unit in the following sections owing to their complex distribution, petrology, and structure, and the general lack of differences among them with respect to their water-bearing characteristics.

Water-bearing Properties

The crystalline rocks are dense and have low porosity, probably less than one percent. Ground water is contained mostly in openings along faults, joints, and irregular fractures. The yield of wells drawing from bedrock depends on the number, size, and degree of interconnection of the openings penetrated by the wells. Relatively high sustained yields can be obtained only where the fractures in the rock are hydraulically connected with a good source of recharge such as a lake, stream, or permeable water-bearing deposits. Drilling to depths greater than about 300 feet is not warranted in most places as the number and size of openings below that depth diminishes rapidly. Studies in other areas underlain by crystalline rocks indicate that, on the average, yields of wells in valleys are higher than the yields of wells on hills. The main reasons for this are: (1) valleys commonly are formed along fault zones or where the rock contains numerous joints, and (2) many valleys contain permeable glacial deposits that act as a reservoir and may transmit substantial quantities of water to the underlying rocks. The data from Rockland County indicate that lithologic differences among the various types of crystalline rocks only have a minor influence on the yields of wells.

levels in till particularly in recharge areas in the uplands, may fluctuate as much as 10 to 15 feet during a year (Ro 15, fig. 8). However, in discharge areas in the lowlands, the range in fluctuation is much smaller. Owing to the relatively large fluctuation of the water table in till many shallow dug wells go dry during periods of below-normal rainfall.

Most of the wells drawing water from till are large-diameter dug wells less than 25 feet deep. The highest recorded yield of a well in till is 5 gpm. However, the yields of most wells drawing from till are considerably less. A few open-end drilled wells have been constructed in thick deposits of till but no records of their yields are available. In order to obtain a satisfactory yield these wells must terminate in sandy zones.

Till no longer is an important source of water for domestic use in Rockland County because it generally cannot supply water in sufficient quantity for use in modern homes and because the water can be readily polluted by leakage from septic tanks, cesspools, and other sources.

STRATIFIED DRIFT

Geologic Properties

Stratified drift consists of water-laid, crudely to well-sorted beds and lenses of gravel, sand, silt, and clay. The extent and thickness of the deposits are shown on plate 3. The deposits underlie the major stream valleys and some form terraces at elevations as high as 100 feet above present stream levels. The known thickness of the deposits ranges from a few feet to about 300 feet. However, if the estimates of depth to bedrock from seismic data are correct, the greatest thickness of stratified drift, about 600 feet, is in the buried channel of the Hudson River (pl. 4). Large variations in texture within relatively short horizontal and vertical distances (pl. 4 and figs. 2 and 6), are indicative of the rapidly changing conditions under which the stratified drift was deposited. Some of the material was deposited while the ice was advancing but probably most was deposited during the retreat of the ice when lobes and isolated masses of wasting ice occupied large depressions such as the Hudson, Hackensack, and Ramapo valleys. Most of the deposits were laid down on flood plains, as deltas, and in lakes, consequently, they range in grain size from gravel to clay.

For convenience in discussing their water-bearing characteristics the stratified deposits are classified according to their predominant lithology into two groups (1) sand and gravel, and (2) clay and silt.

Elongated bodies of brown fine to coarse sand and gravel were deposited in the major valleys by meltwater streams. In some valleys the sand and gravel is interbedded with silt and clay. In others kame terraces were formed by deposition by streams flowing between the bedrock walls of the valley and the margins of the melting ice. Kame deposits commonly consist of poorly sorted coarse sand, gravel, boulders, and lenses of till. Cross-bedded sand and gravel interbedded with silt and clay were deposited as deltas in a few valleys such as those of the Hackensack River and Cedar Pond Brook.

The sand and gravel ranges widely in thickness from less than one foot to about 190 feet. The thickness of the deposits of sand and gravel penetrated by wells in several valleys is as follows: (1) Ramapo River valley, 116 feet at well Ro 509 near Suffern; (2) Mahwah River valley, 54 feet at well Ro 513; (3) Hackensack River valley, 40 feet (figs. 2 and 6); (4) Minisceongo Creek, 184 feet at well Ro 536; and (5) Hudson River valley, about 70 feet (pl. 4).

Thick beds of clay and silt were laid down in lakes that existed in the area during the melting of the last ice sheet. Thin beds and lenses of lacustrine clay and silt are interbedded with layers of sand and gravel in some of the larger valleys and in kame terraces. Deposits of clay and silt laid down in glacial lakes in thin alternate layers are called varves. Deposits of reddish-brown varved clay and silt in the Hackensack River valley are as much as 30 feet thick (figs. 2 and 6). Bluish-gray varved clay is exposed in several places along the shore of the Hudson River mainly between Haverstraw and Stony

Point and occurs at altitudes from 50 feet above sea level to at least 40 feet below. The clay is interbedded with sand and gravel in a few places and elsewhere rests directly on till. Alternate layers of gray and reddish-brown silty clay and clayey silt occur beneath the Hudson River in deposits as much as 160 feet thick (pl. 4). They are overlain by fossiliferous clay and silt of Recent age and are underlain by stratified sand and gravel and till of Pleistocene age.

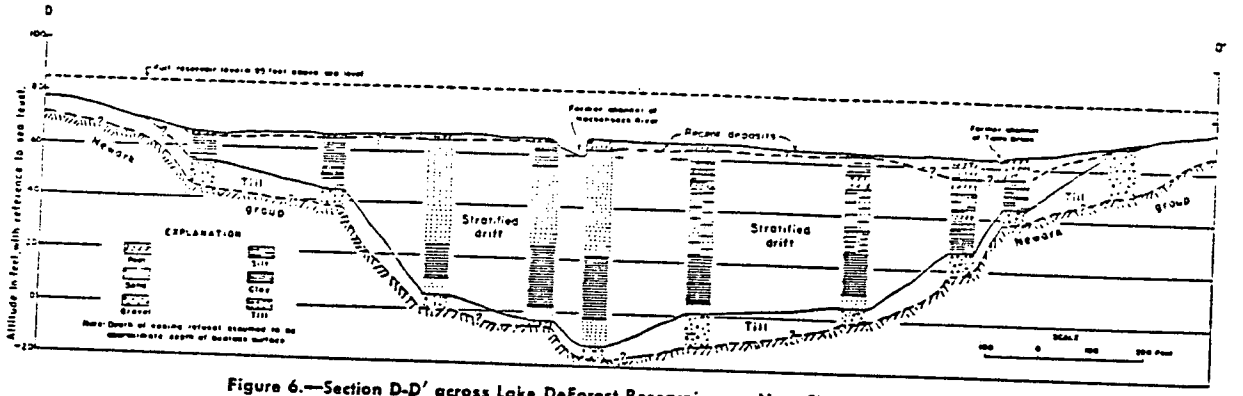


Figure 6.—Section D-D' across Lake DeForest Reservoir near New City—Congers Road.

Water-bearing Properties

The stratified drift in Rockland County is not used to any large extent as a source of water at the present time. The capacity of the drift to yield water varies widely owing to the wide range in the character of the material from relatively impermeable clay to highly permeable sand and gravel. The fine sand, silt, and clay which comprises the bulk of the stratified drift in some valleys yield water very slowly or not at all, whereas the beds of coarse sand and gravel yield copious supplies. The yields of wells in stratified drift range from 8 to 1,700 gpm; the median yield is 183 gpm. The wells range in depth from about 5 to about 170 feet; the median depth is 26 feet. The specific capacity of the wells tapping the drift ranges from 5 to 173 gpm per foot.

Water in stratified drift generally occurs under water-table conditions but locally may be under artesian conditions where permeable beds are overlain by silt and clay. The depth to water ranges from near land surface to 20 feet below. Recharge of the stratified drift takes place mainly by downward percolation of precipitation and by upward leakage from the bedrock. Infiltration of surface water may occur when wells near streams are pumped, and for short periods during flood stages when the river level is higher than the water table. Water in the stratified drift is discharged by evapotranspiration, leakage into streams, and withdrawals by wells.

Miscellaneous pumping-test data obtained from private consultants and drillers are listed in table 18. These data show the drawdowns in pumping wells at different rates of pumping. Figure 7 shows the effect of pumping from well Ro 190 at Suffern on the water levels in two observation wells, Ro 535 and Ro 534 which are about 8 feet north and 410 feet northwest of Ro 190. The hydrographs show that when well Ro 190 is pumped at a rate of about 1,250 gpm, the drawdown in well Ro 535 is about 8 feet and in well Ro 534 is about 1 foot. Well Ro 190 is about 400 feet east of the Ramapo River. Therefore, if the cone of depression around the pumping well was symmetrical it probably reached the river. The graphs in figure 7 do not show the stabilizing effect of recharge from the river owing to the intermittent operation of the pump.

A test conducted in September 1954 at Piermont, in the valley of Sparkill Creek, by Leggette, Brashears, and Graham, consulting ground-water geologists, showed that after well Ro 287 was pumped at a rate of 325 gpm for about 7 hours, the drawdown in well Ro 286, about 250 feet away, was about 13

feet. The drawdown obtained at different pumping rates during another test made in Ro 286 is given in table 15.

RECENT DEPOSITS

The deposits of Recent age consist of sand, gravel, silt, clay, and peat. These deposits overlie deposits of Pleistocene age in the channels and on the floodplains of streams, on lake bottoms, and in swamps. Sand and gravel is mainly restricted to channels and to areas immediately adjacent to the streams. These beds are generally less than 10 feet thick. Silt, clay, and peat are restricted to lakes, the channel of the Hudson River, and the swampy areas adjacent to the other streams. In general these are only a few feet thick but in the Hackensack and Hudson River valleys they reach a thickness of 35 and 120 feet, respectively. The Recent deposits beneath the Hudson River at the Tappan Zee Bridge (pl. 4) are estuarine in character and consist mostly of gray, thin-bedded silt and clay containing shells, plant material, and thin layers of peat and fine sand.

The Recent deposits are of little hydrologic importance because they are thin and of small extent in most places. A few shallow wells may draw water from the permeable beds. Beds of low permeability retard the vertical movement of water into and out of the Recent deposits.

Fluctuations and Trends of Water Levels

Fluctuations of ground-water levels reflect changes in the quantity of water in storage. Recharge from precipitation causes a rise in water levels. Natural discharge, such as spring flow and seepage into streams and lakes, and evapotranspiration; and withdrawals from wells, cause a decline in water levels. Water levels rise when recharge exceeds discharge and decline when discharge exceeds recharge. Short-term fluctuations of water levels in some wells are caused by earthquakes, changes in barometric pressure, and tidal fluctuations.

Figure 8 shows fluctuations in one well (Ro 18) in till and two wells (Ro 77 and Ro 99) in the Newark group, discharge of the Hackensack River at Rivervale, N. J., and precipitation at Spring Valley, N. Y. The hydrograph for well Ro 18 shows seasonal fluctuations in an area unaffected by pumping. The maximum annual range of fluctuations is about 12 feet. The graph shows that, in general, water levels begin to rise in late fall and reach a peak during the following spring. The lowest levels are reached during the summer and early fall when evapotranspiration is greatest and natural discharge exceeds recharge. Departures from the normal seasonal pattern result from unusual precipitation. For example, the two peak levels in late 1955 were caused by hurricanes in August and by record-breaking precipitation in October.

Wells Ro 77 and Ro 99 show a long-term range in fluctuations of about 30 and 40 feet, respectively. The fluctuations in both wells are affected by pumping from wells. Well Ro 77 is at the south end of the Lederle Laboratories plant in Pearl River where an average of about 1 mgd is pumped from the Newark group. The graph for well Ro 77, which is based on records from an automatic water-level recorder, shows that the rise in water level which starts in the spring generally reaches a peak in May. Water levels normally decline during the summer and fall, stabilize for a few months in the winter, and then rise in the following spring. The failure of the water levels to recover to normal peak levels in 1954 is a reflection of unusually heavy and continuous pumping during that year. In 1955, a reduction in pumpage together with above-normal rainfall resulted in an essentially continuous rise of water levels throughout the year.

The hydrograph for Ro 99 at the Summit Park Sanitorium is based in part on records from an automatic water-level recorder and in part on periodic measurements. The graph shows a wide range in seasonal fluctuation. The water level generally declines about 40 feet during the summer months. On September 2, 1959, the water level declined to a record low of 140 feet below the land surface. Part of the decline is natural and part probably reflects large withdrawals from the Newark group. The peak level in 1958 was slightly below the peak level of the previous years of record.

Table 17.—Records of selected wells and test borings in Rockland County—(Continued)

Well number	Location coordinates	Owner or occupant	Year completed	Altitude (feet)	Depth of well (feet)	Diameter (inches)	Depth to bedrock (feet)	Geologic unit	Depth to water (feet)	Type of pump	Yield (gpm)	Temperature °F	Use	Remarks
Ro 50	16X, 14.2S, 1.3E	Rockland State Hospital	1929	100.5	270	16	...	Newark group	50 1951	T	100	..	I	Well No. 1. (a).
Ro 51	16X, 14.4S, 1.3E	do.	1929	100.5	250	16	...	do.	60 1951	T	20	..	I	Well No. 2.
Ro 52	16X, 14.3S, 1.4E	do.	....	113.5	326	16	...	do.	52 1951	T	105	..	I	Well No. 6. Near Ro 50. (a).
Ro 53	16X, 14.4S, 1.1E	do.	....	106.5	295	16	...	do.	70 1951	T	100	..	I	Well No. 3. Near Ro 51. (a).
Ro 54	16X, 14.1S, 1.0E	do.	1929	91.5	435	16	...	do.	38 Aug. 1951	DWT	65	..	I	Well No. 6. Near Ro 57. (a).
Ro 55	16X, 14.1S, 1.3E	do.	1929	102	291	16	...	do.	36 Aug. 1951	DWT	65	..	I	Well No. 7. (a).
Ro 56	16X, 14.3S, 1.1E	do.	1929	78	305	16	...	do.	46.5 Aug. 1951	DWT	100	..	I	Well No. 10. Near Ro 50. (a).
Ro 57	16X, 14.4S, 0.9E	do.	1929	78	301	16	...	do.	10 July 1939	DWT	100	..	I	Well No. 12. (a).
Ro 58	16X, 13.6S, 1.4E	do.	1935	91.2	302	10	20	do.	26 Aug. 1951	DWT	60	..	I	Well No. 13.
Ro 59	16X, 13.5S, 1.4E	do.	1938	82.6	300	10	...	do.	26 Aug. 1951	DWT	60	..	I	Well No. 15. Near Ro 58.
Ro 60	16X, 12.3S, 1.5E	do.	1936	81.5	304	10	72	do.	23.4 Aug. 1951	DWT	50	54	I	Well No. 17. Near Ro 61. Natural flow 10 gpm in 1936; water level 10 ft. above land surface.
Ro 61	16X, 12.2S, 1.7E	do.	1938	73	178	10	30	do.	10.5 Aug. 1951	DWT	100	..	I	Well No. 19. Formerly flowing well. Casing, 0-56 ft.
Ro 62	16X, 12.7S, 1.5E	do.	1938	133	318	10	...	do.	27 Aug. 1951	DWT	60	..	I	Well No. 20. Water level 15 ft., July 1939.
Ro 63	16X, 12.4S, 1.5E	do.	1936	88.5	224	10	72	do.	19.5 Aug. 1951	DWT	150	54	I	Well No. 16. Flows 25 gpm; water level 10 ft. above land surface in 1936. (b).
Ro 64	16X, 13.5S, 2.4E	Sisters of St. Dominic	1923	175	405	10	10	do.	44	DWT	128	..	I	(a).
Ro 65	16X, 12.1S, 1.0W	Lederle Laboratories, Inc.	1937	328	282	8	25	do.	35 1957	DWT	40	52	C	Well A. Yield in 1937 reported to be 100 gpm. Water level 25 ft., 1937. Ro 66, nearby. (a).
Ro 66	16X, 12.1S, 0.9W	do.	1942	330	334	8	...	do.	44 Dec. 1946	DWT	40	52	U	Well B. Drawdown 118 ft. when pumping 150 gpm 1942. Abandoned 1953. Ro 65, nearby. (a).
Ro 67	16X, 12.2S, 0.9W	do.	1939	321	310	8	...	do.	30 1957	DWT	90	52	C	Well C. Near Ro 77. Drawdown 151 ft. when pumping 150 gpm, 1944. Water level 30 ft., 1939. (a).
Ro 68	16X, 11.9S, 1.0W	do.	1941	312	718	8	...	do.	50 1957	DWT	44	54	C	Well D. Near Ro 73. Drawdown 190 ft. when pumping 100 gpm, 1947. Water level 48 ft., Apr. 1947. (a).
Ro 69	16X, 12.1S, 1.1W	do.	1941	323	400	8	...	do.	28 Apr. 1947	DWT	85	52	C	Well E. Near Ro 77. Water level 15 ft., Dec. 1946. (a).
Ro 70	16X, 12.1S, 0.8W	do.	....	315	175	6	...	do.	35 Apr. 1947	DWT	36	52	U	Well F. Drawdown 102 ft. when pumping 36 gpm, 1947. Abandoned 1949. (a).
Ro 71	16X, 12.1S, 1.4W	do.	1941	248	258	24-10	29	do.	Flows Apr. 1957	DWT	220	52	C	Well G. Drilled by rotary method. Specific capacity 1.5 gpm/ft. Flow 25 gpm, 1941. (a).

Table 17.—Records of selected wells and test borings in Rockland County—(Continued)

Well number	Location coordinates	Owner or occupant	Year completed	Altitude (feet)	Depth of well (feet)	Diameter (inches)	Depth to bedrock (feet)	Geologic unit	Depth to water (feet)	Type of pump	Yield (gpm)	Temperature °F	Use	Remarks
Ro 72	16X, 12.1S, 1.2W	Lederle Laboratories, Inc.	1942	303	291	10	86	Newark group	53 Aug. 1950	DWT	20	52	U	Well H. Near Ro 71. Drawdown 157 ft. when pumping 96 gpm, 1942. Water level 33 ft., 1942. Abandoned 1950. Casing, 0-94 ft. (b).
Ro 73	16X, 11.0S, 0.8W	do.	1949	333	328	12	40	do.	80 1957	DWT	30	52	C	Well L. (a).
Ro 74	16X, 11.8S, 1.3W	do.	1950	273	302	12	24	do.	14 1957	DWT	205	52	C	Well T. Specific capacity, 1.8 gpm/ft., 1951. Water level 10 ft., Nov. 1950. Casing, 0-37 ft.
Ro 75	16X, 11.0S, 1.1W	do.	1949	273	300	12	45	do.	15 1957	DWT	185	52	C	Well P. Near Ro 71. Yield reported as 185 gpm with pumping level at 195 ft., 1951. (a).
Ro 76	16X, 11.0S, 1.4W	do.	1950	273	300	12	42	do.	5 1957	DWT	50	52	..	Well Q. Casing, 0-47 ft.
Ro 77	16X, 12.3S, 1.0W	do.	1950	338	350	12	28	do.	48.0 1957	DWT	67	52	O	Well S. Specific capacity, 0.5 gpm/ft., 1950. Water-level record since 1952. Casing, 0-36 ft. (c).
Ro 78	16X, 11.8S, 1.0W	do.	1949	308	341	12	40	do.	90 1952	DWT	65	52	C	Well M. Near Ro 73. Yield 65 gpm with pumping level at 205 ft., 1951. (a).
Ro 79	16X, 12.4S, 1.2W	do.	1951	293	350	12	33	do.	40 1951	...	40	52	U	Well U. Specific capacity 0.2 gpm/ft. (a).
Ro 80	16X, 11.6S, 1.1W	do.	1951	303	350	12	37	do.	35 1951	DWT	110	51	C	Well V. Specific capacity, 0.6 gpm/ft., 1951. Casing, 0-45 ft. (a).
Ro 81	16X, 9.0S, 2.4W	Spring Valley Water Works & Supply Co.	1927	455.1	300	8	50	do.	42 1949	DWT	350	..	PS	Well No. 1, Spring Valley field. Casing, 0-50 ft. Ro 82 Ro 84 nearby. (a).
Ro 82	do.	do.	1928	447.9	450	8	50	do.	63 1949	DWT	350	..	PS	Well No. 2. Near Ro 81. Casing, 0-50 ft. (a).
Ro 83	16X, 9.1S, 2.4W	do.	1924	445.3	253	12	50	do.	50 1949	DWT	400	..	PS	Well No. 3. Near Ro 81. Casing, 0-70 ft. (a).
Ro 84	16X, 9.0S, 2.4W	do.	1924	452.2	256	16–12	50	do.	59 1949	DWT	300	..	PS	Well No. 4. Near Ro 81. Casing, 0-55 ft. (a).
Ro 85	16X, 9.0S, 2.3W	do.	1927	442.5	252	12	50	do.	63 1949	DWT	675	..	PS	Well No. 6. Near Ro 81. Casing, 0-121 ft. (a).
Ro 86	16X, 9.1S, 2.4W	do.	1948	447.3	305	12	30	do.	52 1948	DWT	600	..	PS	Well No. 17. Near Ro 81. Casing, 0-77 ft. Specific capacity, 9 gpm/ft. In 1948 yield was 600 gpm with a drawdown of 65 ft. while two wells nearby were in operation. (a) (b).
Ro 87	16X, 15.3S, 3.3E	do.	1931	59	498	12–6	54	do.	6 1949	DWT	400	..	PS	Well No. 8, Sparkill field. Ro 89 nearby. Casing, 0-62 ft. Specific capacity, 2.3 gpm/ft. (a).
Ro 88	do.	do.	1941	72.5	458	12	92	do.	23 1949	DWT	200	..	PS	Well No. 11. Near Ro 87. Casing, 0-118 ft. Drawdown 182 ft. when pumping 200 gpm in 1949. (a).
Ro 89	do.	do.	1941	58	328	10	77	do.	0 1949	DWT	200	..	PS	Well No. 12. Near Ro 87. Casing, 0-88 ft. Specific capacity, 1.1 gpm/ft., 1949. (a) (b).
Ro 90	16X, 11.7S, 0.2W	do.	1943	260	325	10	88	do.	21 1942	DWT	440	54	PS	Well No. 13, Nanuet field. Near Ro 91. Casing, 0-108 ft. Drawdown 75 ft. when pumping 605 gpm in 1941. (a) (b).
Ro 91	16X, 11.7S, 0.3W	do.	1943	272	375	10	77	do.	30 1942	DWT	480	..	PS	Well No. 14. Ro 90, nearby. Casing, 0-95 ft. Specific capacity, 5.1 gpm/ft., 1942. (a) (b).
Ro 92	16X, 13.0S, 2.4E	do.	1948	174.8	395	12	25	do.	43 1947	DWT	435	..	PS	Well No. 15, Blauvelt field. Casing, 0-60 ft. Specific capacity, 4.5 gpm/ft. in 1947. (a) (b).

REF 2.1.1

Uncontrolled Hazardous Waste Site Ranking System

A Users Manual
(HW-10)

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Dangerous Properties of Industrial Materials

Fifth Edition

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VNR VAN NOSTRAND REINHOLD COMPANY
NEW YORK CINCINNATI ATLANTA DALLAS SAN FRANCISCO
LONDON TORONTO MELBOURNE

mine, ipecacuanic acid, psychotrine, methyl psychotaine, resin.

THR = A centrally acting emetic. Has caused fatalities. Symptoms include retention of urine, fever, diarrhea, violent abdominal pain, dehydration and cardiac irregularities. [*20*] HIGH via oral route. Can cause conjunctivitis with opacity of the cornea. See also emetine.

IPECACUANHA. See ipecac.

IPP. See diisopropyl peroxydicarbanate.

IRIDIUM AMMINE NITRATE. $Ir(NH_3)_5OH(NO_3)_3$, mw: 490.4.

THR = May be impact-sensitive: also may detonate @ red heat. [*19*]

IRIDIUM AMMINE PERCHLORATES.

THR = May be impact-sensitive. [*19*]

IRIDIUM. Slightly yellowish-white, hard brittle metal. Ir, atwt: 192.22, mp: 2410°, bp: 4130°, d: 22.65.

THR = NO data. Probably MOD via oral and inhal routes. Soluble iridium compounds are said to be toxic. However, there are no industrial data available upon which to base a maximum allowable conc in air.

Radiation Hazard: For permissible levels, see Section 5A, Table 5A.5. Artificial isotope ^{192}Ir, $T_{\frac{1}{2}}$ = 74d, decays to stable ^{192}Pt via β's of 0.24 MeV (8%), 0.54 MeV (41%), 0.67 MeV (46%) emits γ's of 0.30–0.61.

Fire Hazard: Mod, in the form of dust when exposed to heat or flame. See also powdered metals. Incandesces with OF_2 or ClF_3. Reacts violently with F_2 @ 260°. [*19*]

IRIDIUM CHLORIDE. $IrCl_3$, mw: 298.6.

Acute tox data: Iv LD_{LO} (dog) = 778 mg/kg. [*3*]

THR = MOD via oral route.

IRISH MOSS. See chondrus extract.

IROKO. See sawdust.

IRON, DUST. Syn: *ferrum*. Silvery-white, tenacious, lustrous, ductile metal. Fe, atwt: 55.8, mp: 1535°, bp: 3000°, d: 7.86, vap. press: 1 mm @ 1787°.

Acute tox data: Ip LD_{50} (mouse) = 26 mg/kg. [*3*]

THR = HIGH via ip route. Iron dust can cause conjunctivitis, choroiditis, retinitis and siderosis of tissues if iron remains in these tissues. Iron ore dust can cause palpebral conjunctivitis, massive pulmonary fibrosis and an increased incidence of lung cancer. An iron oxide fume is generated in welding operations and continued exposure to conc above 30 mg/m^3 of air can cause chronic bronchitis. Fresh iron oxide fume can cause metal fume fever. Iron compounds are susp carc of the lung, liver, connective tissue and reticuloendothelial tissue. [*14, 3*]

Radiation Hazard: For permissible levels, see Section, 5, Table 5A.5. Artificial isotope ^{55}Fe, $T_{\frac{1}{2}}$ = 2.6y, decays to stable ^{55}Mn via ec and emits x-rays. Artificial isotope ^{59}Fe, $T_{\frac{1}{2}}$ = 45d, decays to stable ^{59}Co via β's of 0.27 MeV (48%), 0.48 MeV (51%) and γ's. Emits γ's of 1.10 and 1.29 MeV.

Fire Hazard: Mod, in the form of dust when exposed to heat or flame. See also powdered metals. Reacts violently with Cl_2, ClF_3, F_2, H_2O_2, NO_2, P Na_2C_2, H_2SO_4. [*19*]

Explosion Hazard: Mod in the form of dust when exposed to heat or flame. See also powdered metals

To Fight Fire: Special mixtures of dry chemical.

IRON AMMONIUM CITRATE. Syn: *ferric ammonium citrate*. Thin, transparent, garnet red scales or granules or brownish-yellow powder, odorless or slight ammonia odor, sol in water, insol in alcohol.

THR = U. Used as a trace mineral added to animal feeds. [*109*]

IRON ARSENIDE. See ferric arsenide.

IRON BORIDE. Gray crystals. FeB, mw: 66.67.

THR = Details U. See boron hydrides and borides.

Fire Hazard: Mod; borides can react with moisture and acids to evolve toxic boron hydrides.

Explosion Hazard: A possible explosion hazard.

Disaster Hazard: Dangerous; can react with water steam or acids to evolve toxic and flam fumes.

IRON CARBIDE. FeC_2, mw: 79.9.

THR = Violent reaction with Br_2, Cl_2. [*19*]

IRON CARBONATE.

THR = U. Used as a trace mineral added to animal feeds. See iron. [*109*]

IRON CARBONYL. See iron pentacarbonyl.

IRON (II) CHLORIDE. See ferrous chloride.

IRON (II) CHLORIDETETRAHYDRATE. $FeCl_2 \cdot 4H_2O$, mw: 198.8.

Acute tox data: Oral LD_{50} (rat) = 984 mg/kg; ip LD (mouse) = 93 mg/kg. [*3*]

THR = HIGH via ip and MOD via oral routes.

IRON COMPOUNDS. See corresponding ferric and ferrous compound.

IRON CONTAINING ASBESTOS.

THR = A susp carc for iron, a recog carc for asbestos. See iron and compounds; also asbestos. [*3, 14*]

IRON-DEXTRAN GLYCEROL GLYCOSIDE.

THR = An exper carc. [*3*]

IRON DEXTRAN COMPLEX. For human use, it is sterile dark brown colloidal solvent, water-sol. mw 180,000.

THR = An exper carc. A susp human carc. [*3, 6*]

Fire Hazard: Slight, when exposed to heat or flame.
Disaster Hazard: Mod dangerous; when heated to comp. emits toxic fumes; can react with oxidizing materials.
To Fight Fire: Foam, CO_2, dry chemical.

YL QUINALDINIUM BROMIDE.
= U. See also bromides.
Fire Hazard: U.
Disaster Hazard: Dangerous. See bromides.

YL QUINOLINIUM CHLORIDE. U. A fungicide.
Fire Hazard: U.
Disaster Hazard: Dangerous. See chlorides.

URYL THIOCYANATE. $CH_3(CH_2)_{10}CH_2SCN$, mw: 227.3.
Acute tox data: oral LD_{50} (rat) = 1250 mg/kg. [*3*]
= MOD via oral route. An insecticide.

WRENCITE. See ferrous chloride.

WRENCIUM. A synthetic transuranium element of atomic number 103 and atomic mass 257. Lw.
THR = Radioactive.
Radiation Hazard: Intensely radioactive and therefore highly radiotoxic.

-813. A mixture of aromatic amines. (approx 40% MOCA).
= An exper carc to rats via oral route. [*3*]

ACHATE PRODUCTION FROM SOLID WASTE. See Section 6.

A Syn: *plumbum*. Bluish-gray, soft metal. Pb, wt: 207.21, mp: 327.43°, bp: 1620°, d: 11.288 @ 0° 20°. vap. press: 1 mm @ 973°.
= See lead compounds. A common air contaminant. It is a (S) carc of the lungs and kidney and an exper teratogen. [*3*, *23*]
Radiation Hazard: For permissible levels, see Section 5, Table 5A.5. Natural isotope ^{210}Pb (radium-D, uranium series), $T_{\frac{1}{2}}$ = 21y. Decays to radioactive ^{210}Pb via β's of 0.0015 (19%) MeV. Emits γ's of 046 MeV. ^{210}Pb usually exists in equilibrium th its daughters, ^{210}Bi and ^{210}Po. Natural isotope ^{212}Pb (Thorium-B, thorium Series), $T_{\frac{1}{2}}$ = 10.6 h. Decays to radioactive ^{212}Bi via β's of 0.16 (5%). 0.34 (1%), 0.58 (14%) MeV. Emits γ's of 0.24, 0.34 MeV and x-rays.
Fire Hazard: Mod, in the form of dust when exposed to heat or flame. See also powdered metals.
Explosion Hazard: Mod, in the form of dust when exposed to heat or flame. Violent reactions with NH_4NO_3, ClF_3, H_2O_2, NaN_3, Na_2C_2, Zr. [*19*]
Disaster Hazard: Dangerous; when heated, emits highly toxic fumes; can react vigorously with oxidizing materials.

LEAD ACETATE. Syn: *sugar of lead*. White crystals, sol in water. Commercial grades are frequently brown or gray lumps. $Pb(C_2H_3O_2)_2 \cdot 3H_2O$, mw: 379.35, mp: 75°, anhydrous mp: 280°. d: 2.55.
Acute tox data: ip LD_{LO} (rat) = 204 mg/kg; iv LD_{50} (rat) = 120 mg/kg. [*3*]
THR = HIGH via ip and iv routes. See also lead compounds. A poison. An exper (+) carc and teratogen. [*3*, *9*] Violent reaction with $KBrO_3$. [*19*] An insecticide.

LEAD ACETATE, BASIC. White powder.
$Pb_2OH(C_2H_3O_2)_3$, mw: 608.6.
THR = An exper (+) carc. [*3*, *9*] See also lead acetate. A poison.

LEAD ACETATE (III) TRIHYDRATE.
THR = An exper (+) carc. [*3*, *9*] See also lead acetate.

LEAD ANTIMONATE. Syns: *naples yellow*, *antimony yellow*. Orange yellow powder. $Pb_3(SbO_4)_2$, mw: 993.2.
THR = See lead and antimony compounds.

LEAD ARSENATES. Syn: *lead-o-arsenate*. White crystals. $PbHAsO_4$, mw: 327.1.
Acute tox data: Oral LD_{LO} (human) = 1.4 mg/kg; oral LD_{50} (rat) = 100 mg/kg. [*3*]
THR = HIGH via oral route. See also lead and arsenic compounds. A poison. An exper carc. [*3*, *9*]
Disaster Hazard: Dangerous; on heating, emits highly toxic fumes.

LEAD-*m*-ARSENATE. $AsH_3O_4 \cdot (Pb)x$.
Acute tox data: Oral LD_{50} (rat) = 100 mg/kg; oral LD_{50} (mouse) = 1000 mg/kg; oral LD_{50} (rabbit) = 125 mg/kg. [*3*]
THR = HIGH via oral to MOD via oral routes depending upon species. See also lead arsenate. A poison.

LEAD-*o*-ARSENATE. See lead arsenates.

LEAD ARSENITE. Syns: *lead-o-arsenite*, *lead-m-arsenite*. White powder; $PbAs_2O_4$, mw: 421.
THR = HIGH. See lead compounds and arsenic compounds.
Disaster Hazard: Dangerous; on heating, emits highly toxic fumes.

LEAD-*m*-ARSENITE. See lead arsenite.

LEAD-*o*-ARSENITE. See lead arsenite.

LEAD AZIDE. Colorless needles. $Pb(N_3)_2$, mw: 291.26.
THR = See lead compounds and azides.
Fire Hazard: U.
Explosion Hazard: Severe, when shocked or exposed to heat or flame. Explodes at 250°. Violent reaction with brass, calcium stearate. CS_2, Cu, Zn. [*19*]
Disaster Hazard: Highly dangerous; shock and heat

Acute tox data: Oral LD_{50} (rat) = 6750 mg/kg. [*3*] LD_{50} (rat) = 4500 mg/kg. [*12*]

THR = MOD via oral route. See also manganese compounds and carbamates. An exper teratogen and carc. [*3, 12*] via oral route.

Disaster Hazard: Dangerous; when heated to decomp, emits highly toxic fumes of NO_x and SO_x.

MANGANESE. Reddish-grey or silvery, brittle, metallic element. Mn, atwt: 54.93, mp: 1260°, bp: 1900°, d: 7.20, vap. press: 1 mm @ 1292°.

Acute tox data: ip LD_{50} (mouse) = 53 mg/kg; inhal TC_{LO} (human) = 11 mg/m^3 ⟶ CNS symptoms. [*3*]

THR = HIGH via ip and inhal routes. A known mutagen and (S) carc. [*22, 23*] See manganese compounds.

Radiation Hazard: For permissible levels, see Section 5, Table 5A.5. Artificial isotope ^{54}Mn, $T_{\frac{1}{2}}$ = 300d. Decays to stable ^{54}Cr by ec. Emits γ's of 0.84 MeV and x-rays.

Fire Hazard: Mod, in the form of dust or powder, when exposed to flame.

Spont Heating: No.

Explosion Hazard: Mod, in the form of dust, when exposed to flame. See also powdered metals. Violent reaction with (Al + air), Cl_2, F_2, H_2O_2, HNO_3, NO_2, P, SO_2. [*19*]

Disaster Hazard: Mod dangerous; will react with water or steam to produce hydrogen; can react with oxidizing materials.

To Fight Fire: Special dry chemical.

MANGANESE ACETATE. Pale red crystals, very sol in water and alcohol. $Mn(C_2H_3O_2)_2 \cdot 4H_2O$, mw: 245, d: 1.54, mp: 80°.

THR = See manganese compounds. Used as a trace mineral added to animal feeds. [*109*]

MANGANESE ARSENATE. Reddish-white, crystalline solid. $MnHAsO_4$, mw: 194.9.

THR = HIGH tox. See arsenic and manganese compounds.

MANGANESE BACITRACIN.

THR = U. Used as a food additive permitted in food for human consumption. [*109*] See also manganese compounds.

MANGANESE BENZOATE.

See manganous benzoate.

MANGANESE BROMIDE. See manganese dibromide.

MANGANESE CACODYLATE. Reddish-white crystals. $Mn[(CH_3)_2AsO_2]_2$, mw: 328.9.

THR = HIGH. See arsenic and manganese compounds.

MANGANESE CHLORIDE.

See manganese dichloride.

MANGANESE COMPOUNDS.

THR = Chronic manganese poisoning is a clearly characterized disease which results from the inhal of fumes or dusts of manganese. Exposure to heavy conc of dusts or fumes for as little as three months may produce the condition, but usually cases develop after 1–3 yrs of exposure. The CNS is the chief site of damage. If cases are removed from exposure shortly after the appearance of symptoms, some improvement in the patient's condition frequently occurs, though there may be some residual disturbances in gait and speech. When well established, however, the disease results in permanent disability.

Individuals exposed to dusts and fumes of manganese have been reported by several investigators to suffer from a much higher incidence of upper respiratory infections and pneumonia than does the general population. It has not yet been possible to prove that a definite pneumonitis results in humans from exposure to manganese dusts or fumes under industrial conditions. However, experiments with mice have produced definite and striking lung pathology which varied in intensity with the length of exposure to the dust.

Chronic manganese poisoning begins usually with complaints of languor and sleepiness. This is followed by weakness in the legs and the development of a stolid, mask-like facies, and the patient speaks with a slow monotonous voice. Then muscular twitchings appear, varying from a fine tremor of the hands to coarse, rhythmical movements of the arms, legs and trunk. Nocturnal cramps of the legs appear about the same time. There is a slight increase in tendon reflexes, ankle and patellar clonus, and a typical Parkinsonian slapping gait. The handwriting may be quite minute. There are no sensory disturbances, and no eye, gastrointestinal or genitourinary complaints. The urine and spinal fluid are normal, and the blood shows no abnormality or only a slight leucopenia. The symptoms may simulate progressive bulbar paralysis, postencephalitic Parkinsonism, multiple sclerosis, amyotrophic lateral sclerosis and progressive lenticular degeneration (Wilson's Disease). An exper (+) carc. [*12, 14, 23, 117*] Often a history of exposure is the only aid in establishing the diagnosis. The blood may show increased erythrocyte formation and increased osmotic fragility. Early administration of EDTA can hasten recovery, but it is of little value in cases of long standing.

ERCUROUS HYPOPHOSPHATE. $Hg_4P_2O_6$, mw: 0.3.
THR = HIGH. See mercury compounds. Unstable. Decomp explosively. [*19*]

RCUROUS IODATE. Yellowish crystals. $Hg_2(IO_3)_2$, w: 751.06, mp: decomp.
THR = See mercury compounds, inorganic, and iodates.

RCUROUS IODIDE. Yellow tetragonal crystals or morphous powder. HgI, mw: 327.50, mp: sublimes @ 40°, bp: decomp @ 290°, d: 7.70.
Acute tox data: Oral LD_{50} (mouse) = 110 mg/kg; ipLD_{50} (mouse) = 50 mg/kg. [*3*]
THR = HIGH via oral and ip routes. See mercury compounds, inorganic, and iodides.

ERCUROUS MONOHYDROGEN-*o*-ARSENATE. Yellow-red crystals. Hg_2HAsO_4, mw: 541.14.
THR = HIGH. See arsenic compounds and mercury compounds, inorganic.

MERCUROUS NITRATE. Short, colorless, efflorescent crystals. $Hg_2(NO_3)_2 \cdot 2H_2O$, mw: 561.26, mp: 70°, d: 4.79 @ 4°.
Acute tox data: Oral LD_{50} (rat) = 297 mg/kg; oral LD_{50} (mouse) = 388 mg/kg; ipLD_{50} (mouse) = 5 mg/kg. [*3*]
THR = HIGH via oral and ip routes. See mercury compounds, inorganic, and nitrates. Violent reaction with C, P. [*19*]

ERCUROUS NITRATE, AMMONIATED. Syn: *black precipitate*. Black powder, $Hg_2ONH_2 \cdot Hg_2(NO_3)_2$, mw: 958.4.
THR = See mercury compounds, inorganic, and nitrates.

MERCUROUS NITRITE. Yellow crystals. $Hg_2(NO_2)_2$, mw: 493.24, mp: decomp @ 100°, d: 7.33.
THR = HIGH. See mercury compounds, inorganic, and nitrites.

ERCUROUS OXALATE. White crystals. $Hg_2C_2O_4$, mw: 489.24.
THR = See oxalates and mercury compounds, organic.

ERCUROUS OXIDE, BLACK. Black to grayish-black powder. Hg_2O, mw: 417.22, mp: decomp @ 100°, d: 9.8.
THR = HIGH. See mercury compounds, inorganic.
Fire Hazard: Mod, by chemical reaction; an oxidizer. Reacts violently with H_2O_2, K, Na, S, (H_2S + BaO + air). [*19*]
Disaster Hazard: Dangerous; when heated to decomp, emits highly toxic fumes of mercury; can react with reducing materials.

MERCUROUS PHOSPHATE. Heavy white powder. Hg_3PO_4, mw: 696.85.
THR = See mercury compounds, inorganic.

MERCUROUS SULFATE. White crystalline powder. Hg_2SO_4, mw: 497.28, mp: decomp, d: 7.56.
THR = See mercury compounds, inorganic, and sulfates.

MERCUROUS SULFIDE. Black crystals. Hg_2S, mw: 433.24, mp: decomp.
THR = See mercury compounds, inorganic, and sulfides.

MERCUROUS TARTRATE. Yellowish-white crystalline powder. $Hg_2C_4H_4O_6$, mw: 549.29.
THR = See mercury compounds, organic.

MERCURY. Silvery liquid, metallic element. Hg, atwt: 200.7, mp: −38.89°, bp: 356.9°, d: 13.546, vap. press: 1 mm @ 126.2°.
Acute tox data: Oral LD_{LO} (human) = 1429 mg/kg; inhal TC_{LO} (human) = 0.17 mg/m^3 for 40 yrs ⟶ CNS problems; ivTD_{LO} (human) = 29 mg/kg; ⟶ GI symptoms. [*3*]
THR = HIGH to CNS, GI tract. See mercury compounds. An exper neo. [*3*] Reacts violently with acetylene, NH_3, BPI_2, Cl_2, ClO_2, CH_3N_3, Na_2C_2, nitromethane (butyne diol + acid). [*19*]
Radiation Hazard: For permissible levels, see Section 5, Table 5A.5. Artificial isotope ^{203}Hg, $T_{\frac{1}{2}}$ = 47d. Decays to stable ^{203}Tl by emitting β's of 0.21 MeV. Emits γ's of 0.28 MeV.
Disaster Hazard: Dangerous; when heated emits highly toxic fumes.

MERCURY ACETAMIDE. White powder. CH_3CONHg, mw: 257.7.
THR = HIGH. See mercury compounds, organic.

MERCURY ACETATE. See mercurous acetate or mercuric acetate.

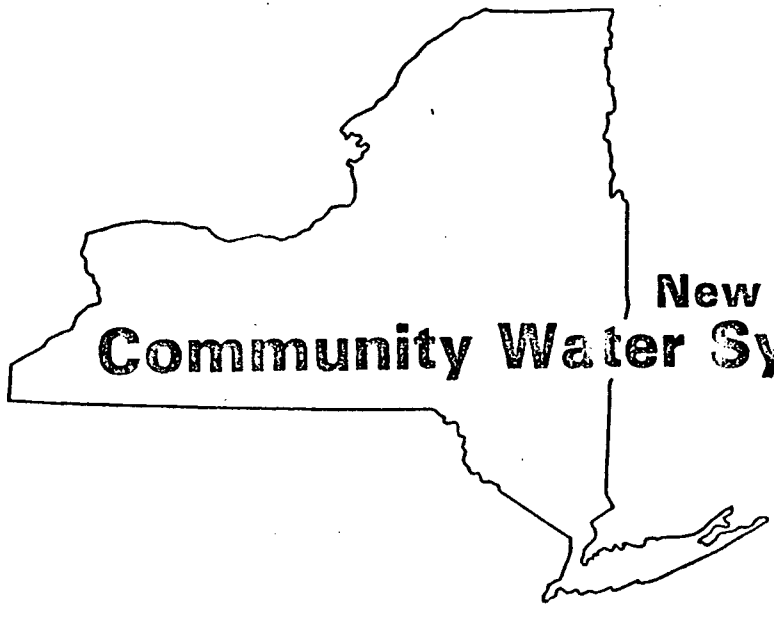
MERCURY ALANINE. See mercury-α-aminopropionate.

MERCURY-*p*-AMINOPHENOL ARSENATE. See mercury atoxylate.

MERCURY-α-AMINOPROPIONATE. Syn: *mercury alanine*. White crystals, water-sol. $Hg[CH_2CH(NH_2)COO]_2$, mw: 374.8.
THR = HIGH. See mercury compounds, organic.

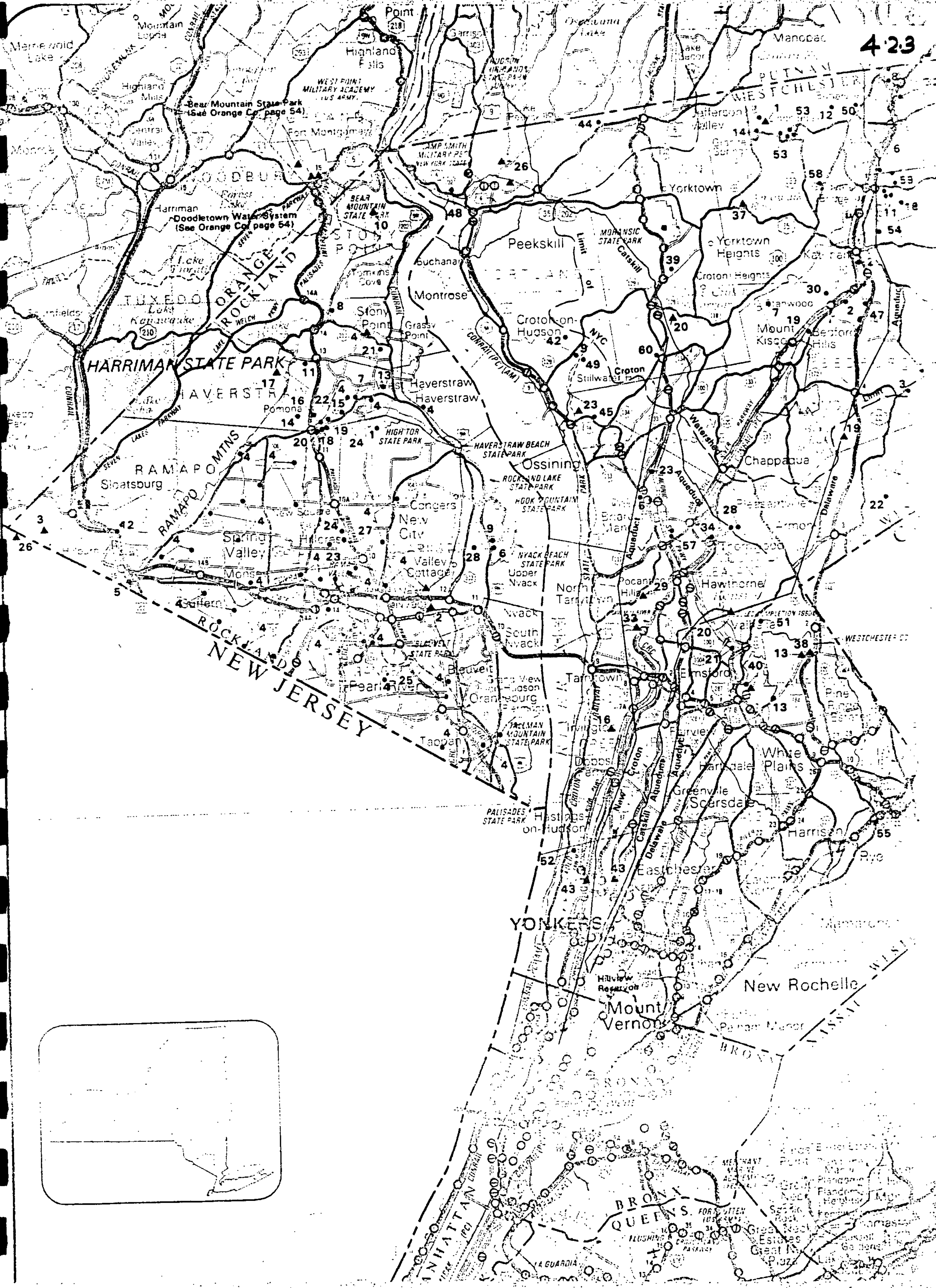
MERCURY, AMMONIATED. See mercuric ammonium chloride.

MERCURY ANTIMONY SULFIDE. Gray-black powder. Mixture of equal parts of black mercury sulfide and gray antimony sulfide.
THR = See mercury compounds, antimony and sulfides.



New York State Atlas of Community Water System Sources 1982

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION



PUTNAM
WESTCHESTER
ORANGE
ROCKLAND
NEW JERSEY
HARRIMAN STATE PARK
RAMAPO MTNS
Bear Mountain State Park
(See Orange Co. page 54)
Doodletown Water System
(See Orange Co. page 54)
BEAR MOUNTAIN STATE PARK
WEST POINT MILITARY ACADEMY
HIGH TOR STATE PARK
HAVERSTRAW BEACH STATE PARK
ROCKLAND LAKE STATE PARK
HOOK MOUNTAIN STATE PARK
NYACK BEACH STATE PARK
BLAUVELT STATE PARK
TALLMAN MOUNTAIN STATE PARK
PALISADES STATE PARK
MOHANSIC STATE PARK
Highland Falls
Fort Montgomery
Harriman
Sloatsburg
Tuxedo
Highland Mills
Central Valley
Monroe
Stony Point
Grassy Point
Tomkins Cove
West Haverstraw
Haverstraw
Pomona
Spring Valley
Monsey
Suffern
New Square
Hillcrest
Congers
New City
Valley Cottage
Upper Nyack
Nyack
South Nyack
Blauvelt
Pearl River
Orangeburg
Tappan
Peekskill
Buchanan
Montrose
Croton-on-Hudson
Ossining
Yorktown
Yorktown Heights
Croton Heights
Mount Kisco
Bedford Hills
Chappaqua
Pleasantville
North Tarrytown
Pocantico Hills
Hawthorne
Valhalla
Tarrytown
Elmsford
Irvington
Dobbs Ferry
Hastings-on-Hudson
Hartsdale
White Plains
Greenville
Scarsdale
Harrison
Rye
Eastchester
YONKERS
Hillview Reservoir
Mount Vernon
New Rochelle
Pelham Manor
BRONX
QUEENS
MANHATTAN
Great Neck Estates
LA GUARDIA

ROCKLAND COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
1	Lake Lucille Property Owners Association	NA.	Wells
2	Nyack Village	20090.	Hackensack River
3	Pothat Water Company	125.	Potake Pond
4	Spring Valley Water Company Inc.	227900.	Deforest Lake, Cedar Brook, Wells
5	Suffern Village	11100.	Wells
Non Municipal Community			
6	Barcore Pump & Electric Company. Bear Mountain State Park (See No 93 Orange Co, Page 72)	17.	Wells
7	Birchwood Bungalows	140.	Wells
8	Cedar Park Trailer Park	17.	Wells
9	Cozy Bungalows	NA.	Wells
10	Doodletown Water System (See also No 104 Orange Co, Page 72)	20000.	Doodletown Pond
11	Fountain Head Trailer Park	100.	Wells
12	George Demas	30.	Wells
13	Helen Hayes Hospital	500.	Wells
14	Hitor Properties	450.	Wells
15	Ivy Glen Trailer Park	50.	Wells
16	JDR Realty Trailer Park	30.	Wells
17	Letchworth Village Developmental Center	5400.	Horse Chock Brook (First Reservoir)
18	Mazza Trailer Park	20.	Wells
19	Mazza-Leone Mobile Home Court	80.	Wells
20	Mt Ivy Trailer Park	170.	Wells
21	Mt View Trailer Park	190.	Wells
22	Parkway Trailer Court	240.	Wells
23	Russian Orthodox Convent-Home	70.	Wells
24	Simons Bungalows	30.	Wells
25	St Dominic's Convent-Home	250.	Wells
26	St Mary Villa	55.	Sheppard Pond (New Jersey)
27	Sunrise Bungalows	20.	Wells
28	Tolstoy Foundation	115.	Wells
29	Wexler Apartments	45.	Wells

WESTCHESTER COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
1	Amawalk-Shenorock Water District	2400.	Wells, Lake Shenorock
2	Bedford Consolidated Water District	6150.	Wells (Infiltration Gallery)
3	Bedford Farms Water Company	480.	Wells
4	Bloomingside Realty, Inc	300.	Wells
5	Briarcliff Manor Village	7100.	Wells
6	Candlewood Park	175.	Wells
7	Cedar Downs Water District	251.	Wells
8	Croton Falls Water District	250.	Wells
9	Croton-on-Hudson Village	7000.	Wells
10	Forest Park Water Company Plant #1	76.	Wells
11	Goldensbridge Community Association	130.	Wells
12	Greenbriar Subdivision	240.	Wells
13	Harrison Water District #1	7000.	Rye Lake, Wells
14	Horton Estates Water Trust	200.	Wells
15	Indian Hill Subdivision	96.	Wells
16	Irvington Village	6300.	Harriman Reservoir
17	Jiwengsville Farm Association	50.	Wells
18	Lake Katonah Club Inc	190.	Wells
19	Mount Kisco Village	8200.	Byram Lake, Wells
20	New York City - Aqueduct System (Page 76)		Amawalk, Muscoot, New Croton and Titicus Reservoirs (Croton Aqueduct System); Cross River Reservoir[1](Croton and Delaware Aqueduct Systems); Kensico Reservoir[2] (Catskill and Delaware Aqueduct Systems)
21	North Castle Water District #1	2500.	Wells
22	North Castle Water District #2	1200.	Wells
23	Ossining Village	20196.	Indian Brook Reservoir, Wells
24	Pabst Water Company Inc	260.	Wells
25	Pamela Lane Water Supply	40.	Wells
26	Peekskill City	18236.	Peekskill Hollow Brook
27	Pietschs Garden	250.	Wells
28	Pleasantville Village	7600.	Wells
29	Pocantico Hills Water District	252.	Reservoirs 1, 2, 3, 4
30	Roosevelt Drive Water Users	80.	Wells
31	Salem Acres Association	154.	Wells
32	Sunset Ridge Water District	600.	Wells
33	Tarrytown Village	10648.	Tarrytown Reservoir
34	Thornwood Water District	5602.	Wells
35	Truesdale Lake Property Owners Association	400.	Wells
36	Twin Lakes Water Works Corporation	350.	Wells
37	Westchester County Water District #2	NA.	Amawalk Reservoir
38	Westchester Joint Water Works #1	50000.	Rye Lake
39	Westview Well Association	18.	Wells
40	White Plains City	50000.	White Plains Reservoirs, Wells
41	Wild Oaks Water Company	410.	Wells
42	Windsor Oaks Property Owners Association	55.	Wells
43	Yonkers City	200000.	Sawmill River, Grassy Sprain Reservoir
44	Yorktown Water Storage & Distribution	31988.	Wells
Non-Municipal Community			
45	Asthmatic Childrens Foundation - New York	100.	Wells
46	Bedford Apartments	50.	Wells
47	Bedford Hills Correctional Facility	800.	Wells
48	Camp Smith	1250.	Wells
49	Danish Home for the Aged Inc	25.	Wells
50	Heritage Hills Water Works Corporation	1200.	Wells
51	Jennie Clarkson Home	NA.	Wells
52	Julia Dykman Andrus Childrens Home	120.	Wells
53	Lincoln Hall School	NA.	Wells
54	Marcega Buildings	NA.	Wells
55	Miriam Osborn Memorial Home	250.	Wells
56	Oakridge Condominium	993.	Wells
57	Pace University	NA.	Wells
58	Somers Manor Nursing Home Inc	560.	Wells
59	The Farm P/O Wild Oaks Park Inc	16.	Wells
60	Wiltwyck School for Boys	50.	Wells

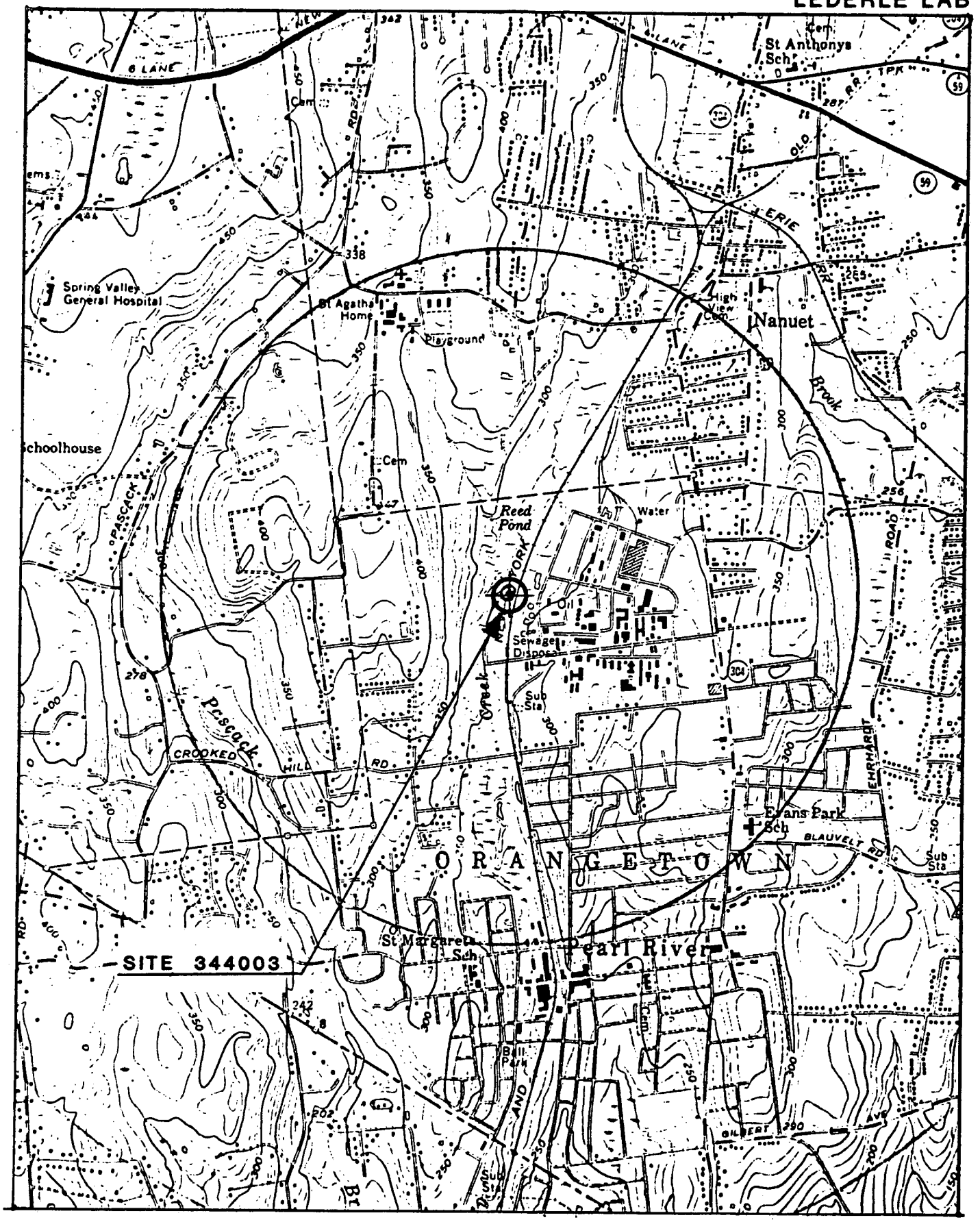
[1]Functions as part of Croton System, but has limited capability to pump into the Delaware System.
[2]Functions as a regulating reservoir for both systems.

4.3.3

Ref 5.1.1

Figure 1

LEDERLE LAB



COORDINATES:

LAT. 41° 04' 30"

LONG. 74° 01' 33"

MAP SOURCE

USGS MAP PARK RIDGE QUAD.

NEW YORK-ROCKLAND CTY.

7.5 MINUTE SERIES (1955)

REF 6.1.9

LEDERLE LABORATORIES

Lederle

A Division of AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK 10965
AREA CODE 914 735-5000

October 30, 1981

Mr. Richard Gardineer, P. E.
Senior Sanitary Engineer
New York State Department of Environmental Conservation
202 Mamaroneck Avenue
White Plains, NY 10601

RE: Renewal of Sanitary Landfill Area 2A
Operation Permit Number 0532

Dear Mr. Gardineer:

Enclosed, please find the original and two copies of The New York State Department of Environmental Conservation "Application for approval to operate a Solid Waste Management Facility" and three (3) copies of the "Report on Sanitary Landfill Area 2A Operation and Plans". A check for the $100.00 renewal fee is also enclosed.

"Attachments to this Permit Renewal Application are submitted in two parts: a main section and a collateral confidential section to which reference is made in the main section. The confidential section is enclosed separately in a sealed envelope bearing the legend, 'CONFIDENTIAL INFORMATION OF AMERICAN CYANAMID COMPANY'. In sum, the enclosed confidential section makes a business confidentiality claim and requests confidential treatment."

If you have questions regarding this submission, please contact this office. Thank you for your consideration.

Very truly yours,

Thomas J. Reilly, P.E.
Head
Environmental Control
Department

TJR:kad

enclosure

cc: Mr. John Parnell, P.E.
Solid Waste Engineer
Rockland County Department of Health
Pomona, New York 10970

6.2.9

MAIN INFORMATION SECTION
OF
AMERICAN CYANAMID COMPANY

LEDERLE LABORATORIES DIVISION
OF
AMERICAN CYANAMID COMPANY
PEARL RIVER, NY 10965

RENEWAL APPLICATION AND REPORT ON SANITARY LANDFILL AREA 2A OPERATION AND PLANS

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
OPERATION PERMIT NUMBER 0532

10/30/81

Copy Number 3

Report By: T. J. Reilly, P.E.

Date: October 1981

Approved By:

A. L. Smith
Plant Manager

2.2 b (2) - (continued)

The percent distribution has been developed from existing daily records. The solid wastes deposited in the sanitary landfill are estimated to be approximately 10,000 to 15,000 cubic yards per year (loose volume).

C. Calculated Life of Facility

Utilizing the recommended Sanitary Landfill techniques (area, trench and ramp slope) at a rate of 7 tons of material per day, the expected life of the sanitary landfill site #2A is 1 year.

2.2 b (3) - Environmental Impact Statement

The Lederle landfill has been in use since the 1920's. The landfill area ends in rising slopes to the West which are tree covered and provide an excellent buffer. In the early years of operation, the landfill was brought to a common grade utilizing fill and cover techniques very similar to the "open area" landfill operations of today. A major drainage system was installed during the early 1950's on the East boundary of the landfill to maintain proper surface flow from the total Lederle area. In the mid 1960's a managed landfill operation was begun in the area. The word "managed" is used here primarily to indicate that at this point in time, final grades of the landfill program and direction of the work progress were established. The managed landfill operation continues today using the open area-ramp method. No probelms have been experienced with the landfill operation.

The long range plans for the development of this area include a road network, drainage, utilities and buildings as further plant expansion may be justified.

Cost Data: Refer to collateral confidential section

Incineration can account for only 60% of the materials currently deposited in the landfill area. Incinerator ash plus 40% essentially non burnables will amount to a volume in excess of 4,000 to 6,000 cubic yards per year that will require land burial as above. Preliminary costs for an additional twenty ton per day plant incinerator are estimated to be currently in excess of $1,000,000. "Clean" type acceptable wastes such as scrap metal, metal drums, fiber drums, cardboard and certain production materials are currently removed through contract disposal and sale for recycle or reuse. The materials disposed in the sanitary landfill are the types currently not amenable for recycling or reuse due to economic or environmental concerns.

ANALYSIS FOR METALS, CYANIDES AND PHENOLS
American Cyanamid - Lederle Laboratory
June 1981 - By Radian Corporation

POLLUTANT*	DETECTION LIMIT	PEARL BROOK	MONITORING WELL AT SOUTH PROPERTY LINE 81-1	MONITORING WELL AT SOUTH PROPERTY LINE 81-A	MONITORING WELL AT SOUTH PROPERTY LINE 81-C
Antimony	0.005	L 0.005	L 0.005	L 0.005	L 0.005
Arsenic	0.003	L 0.003	L 0.003	L 0.003	L 0.003
Beryllium	0.001	L 0.001	L 0.001	L 0.001	L 0.001
Cadmium	0.008	L 0.008	L 0.008	L 0.008	L 0.008
Chromium	0.001	0.018	0.014	0.010	0.006
Copper	0.001	0.045	0.004	L 0.001	0.056
Lead	0.004	0.011	L 0.004	0.016	0.008
Mercury	0.0002	L 0.0002	L 0.0002	0.0045	0.002
Nickel	0.003	0.037	0.042	0.080	0.069
Selenium	0.004	L 0.004	L 0.004	L 0.004	L 0.004
Silver	0.001	L 0.001	L 0.001	L 0.001	L 0.001
Thallium	0.003	L 0.003	L 0.003	L 0.003	L 0.003
Zinc	0.003	0.094	0.053	0.12	0.067
Cyanide	0.020	0.027	0.058	0.126	0.027
Phenols	0.005	L 0.005	L 0.005	L 0.005	0.015

* As published in the May 19, 1979 Federal Register

(Note: L = Less Than)

6.4.9

ANALYSES FOR PART C POLLUTANTS
B. ORGANIC SPECIES
AMERICAN CYANAMID - LEDERLE LABORATORIES
June 1981 - By Radian Corporation

	CONCENTRATION, Mg/L			
	MONITORING WELL AT SOUTH PROPERTY LINE 81-A	MONITORING WELL AT SOUTH PROPERTY LINE 81-1	MONITORING WELL AT SOUTH PROPERTY LINE 81-C	PEARL BROOK (MUDDY CREEK)
I. GC-MS Fraction - Volatile Compounds				
Benzene	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND
Chloroform	ND	D	D	ND
1,1-Dichloroethane	ND	ND	ND	ND
Methylene Chloride	ND	29.0*	D	6.7*
Toluene	ND	ND	D	ND
1,1,1-Trichloroethane	ND	D	ND	ND
Trichloroethylene	ND	D	D	ND
II. GC-MS Fraction-Acid Compounds				
2-Nitrophenol	D	ND	ND	ND
Phenol	0.042	ND	ND	ND
III. GC-MS Fraction-Base/Neutral Compounds				
bis(2-Ethylhexyl)phthalate	D	D	ND	D
1,4-Dichlorobenzene	ND	ND	ND	ND
Diethylphthalate	ND	ND	D	D
Di-n-butyl phthalate	D	D	D	D
Naphthalene	ND	ND	ND	ND
Phenanthrene/Anthracene	D	ND	ND	ND
IV. GC-MS Fraction Pesticides	No Species Detected			

[1]As it appears in the May 19, 1980, Federal Register.
[2]These compounds are indistinguishable under the conditions employed.
*Determined by direct aqueous injection.

6.6.9

LEDERLE LABORATORIES

A Division of AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK 10965
AREA CODE 914 735-5000

October 30, 1981

Mr. Richard Gardineer, P. E.
Senior Sanitary Engineer
New York State Department of Environmental Conservation
202 Mamaroneck Avenue
White Plains, NY 10601

RE: Renewal of Sanitary Landfill Area 3
Operation Permit Number 0532

Dear Mr. Gardineer:

Enclosed, please find the original and two copies of The New York State Department of Environmental Conservation "Application for approval to operate a Solid Waste Management Facility" and three (3) copies of the "Report on Sanitary Landfill Area 3 Operation and Plans". A check for the $100.00 renewal fee is also enclosed.

"Attachments to this Permit Renewal Application are submitted in two parts: a main section and a collateral confidential section to which reference is made in the main section. The confidential section is enclosed separately in a sealed envelope bearing the legend, 'CONFIDENTIAL INFORMATION OF AMERICAN CYANAMID COMPANY'. In sum, the enclosed confidential section makes a business confidentiality claim and requests confidential treatment."

If you have questions regarding this submission, please contact this office. Thank you for your consideration.

Very truly yours,

Thomas J. Reilly, P.E.
Head
Environmental Control
Department

TJR:kad

enclosure

cc: Mr. John Parnell, P.E.
Solid Waste Engineer
Rockland County Department of Health
Pomona, New York 10970

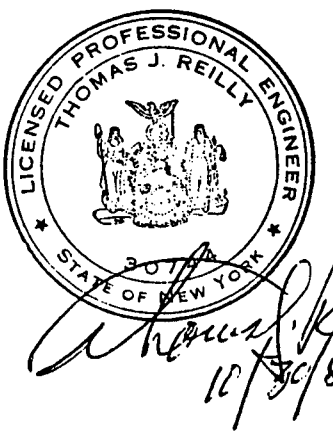
6.7.9

MAIN INFORMATION SECTION
OF
AMERICAN CYANAMID COMPANY

LEDERLE LABORATORIES DIVISION
OF
AMERICAN CYANAMID COMPANY
PEARL RIVER, NY 10965

RENEWAL APPLICATION AND REPORT ON
SANITARY LANDFILL AREA 3
OPERATION AND PLANS

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
OPERATION PERMIT NUMBER 0532



Copy Number 1

Report By: T. J. Reilly, P.E.

Date: October 1981

Approved By:

A. L. Smith
Plant Manager

2-1. ANALYSIS FOR METALS, CYANIDES AND PHENOLS
American Cyanamid - Lederle Laboratory
June 1981 By Radian Corporation

POLLUTANT	DETECTION LIMIT	PEARL BROOK (Muddy Creek) PB	MONITORING WELL AT SOUTH PROPERTY LINE 81-1	MONITORING WELL AT SOUTH PROPERTY LINE 81-A	MONITORING WELL AT SOUTH PROPERTY LINE 81-C
1M Antimaony	0.005	0.005	0.005	0.005	0.005
2M Arsenic	0.003	0.003	0.003	0.003	0.003
3M Beryllium	0.001	0.001	0.001	0.001	0.001
4M Cadmium	0.008	0.008	0.008	0.008	0.008
5M Chromium	0.001	0.018	0.014	0.010	0.006
6M Copper	0.001	0.045	0.004	0.001	0.056
7M Lead	0.004	0.011	0.004	0.016	0.008
8M Mercury	0.0002	0.0002	0.0002	0.0045	0.002
9M Nickel	0.003	0.037	0.042	0.080	0.069
10M Selenium	0.004	0.004	0.004	0.004	0.004
11M Silver	0.001	0.001	0.001	0.001	0.001
12M Thallium	0.003	0.003	0.003	0.003	0.003
13M Zinc	0.003	0.094	0.053	0.12	0.067
14M Cyanide	0.020	0.027	0.058	0.126	0.027
15M Phenols	0.005	0.005	0.005	0.005	0.015

As published in the May 19, 1979, Federal Register

A-99

6.8.9

2-2 ANALYSES FOR PART C POLLUTANTS
B. ORGANIC SPECIES
AMERICAN CYANAMID - LEDERLE LABORATORIES
June 1981 - By Radian Corporation

	CONCENTRATION, Mg/L			
	MONITORING WELL AT SOUTH PROPERTY LINE 81-A	MONITORING WELL AT SOUTH PROPERTY LINE 81-1	MONITORING WELL AT SOUTH PROPERTY LINE 81-C	PEARL BROOK (MUDDY CREEK)
I. GC-MS Fraction - Volatile Compounds				
Benzene	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND
Chloroform	ND	D	D	ND
1,1-Dichloroethane	ND	ND	ND	ND
Methylene Chloride	ND	29.0*	D	6.7*
Toluene	ND	ND	D	ND
1,1,1-Trichloroethane	ND	D	ND	ND
Trichloroethylene	ND	D	D	ND
II. GC-MS Fraction-Acid Compounds				
2-Nitrophenol	D	ND	ND	ND
Phenol	0.042	ND	ND	ND
III. GC-MS Fraction-Base/Neutral Compounds				
bis(2-Ethylhexyl)phthalate	D	D	ND	D
1,4-Dichlorobenzene	ND	ND	ND	ND
Diethylphthalate	ND	ND	D	D
Di-n-butyl phthalate	D	D	D	D
Naphthalene	ND	ND	ND	ND
Phenanthrene/Anthracene	D	ND	ND	ND
IV. GC-MS Fraction Pesticides	No Species Detected			

[1]As it appears in the May 19, 1980, Federal Register.
[2]These compounds are indistinguishable under the conditions employed.
*Determined by direct aqueous injection.

6.9.9

3-2 LAND DISPOSAL
LANDFILLS, SURFACE IMPOUNDMENTS AND/OR WASTE PILES

NOTE: COMPLETE 3-2.1 THROUGH 3-2.3 FOR EACH INDIVIDUAL LAND DISPOSAL SWMU WHICH EITHER IS CURRENTLY OR HAS PREVIOUSLY BEEN OPERATED ON YOUR SITE.

3-2.1 WASTE CHARACTERISTICS

Provide the following information regarding the wastes that are/have been stored, treated, or disposed of in the identified land disposal unit. Identify the unit according to your map identifier code and provide the appropriate EPA process code.[2] Indicate the operational status of the unit, identifying the first year of operation for active units or the inclusive dates of operation [from - to] for units presently inactive. Include the hazardous waste code from 40 CFR, Subpart D for each listed hazardous waste handled at each unit. If you handle/handled hazardous wastes which are not cited in 40 CFR, Subpart D, enter the code(s) from 40 CFR, Subpart C that describe(s) the characteristics and/or the toxic constituents of those hazardous wastes.[2] For any wastes which do not have a corresponding EPA hazardous waste number, please determine, as best you can, if the particular waste would be considered a hazardous waste or to contain hazardous waste constituent(s) under RCRA and provide waste descriptions.[2] For each waste, indicate the quantity that was/is handled on an ANNUAL basis. Provide the appropriate unit of measure (e.g., tons, cubic yards, drums or gallons). Please indicate (x) in last column if any prior or current release of hazardous waste or hazardous waste constituents was/is associated with the unit described.

SWMU TYPE/ UNIT IDENTIFIER[1]	SIZE	OPERATIONAL STATUS	EPA PROCESS CODE	EPA HAZARDOUS WASTE NO. OR WASTE DESCRIPTION[2]	ESTIMATED ANNUAL QUANTITY (SPECIFY UNITS)	ASSOCIATED RELEASE?
LD-01 *	89,000 CY	ACTIVE: ____ YEAR START: ____ INACTIVE X INCLUSIVE YEARS: 1946 - 1966 EXCEPT AS NOTED BELOW	D80	**		NO EVIDENCE OF RELEASE
				INCINERATOR ASH		
				GLASS		
				DEBRIS		
				PLANT TRASH (PAPER, WOOD, CARDBOARD, METAL)	4450 CY/YR. COMPACTED VOLUME	
				VITAMINS		
				WASTEWATER TREATMENT SLUDGE		
				FERMENTATION CAKE		
		1946 TO APPROX. 1962		SOLVENTS / OPEN BURNING	12,500 GAL/YR. FOR 16 YRS.	
		1946 TO APPROX. 1962		ACIDS / LIMESTONE NEUTRALIZATION	60 GAL/YR. FOR 16 YRS.	
				REACTIVE/EXPLOSIVE CHEMICALS FROM LABORATORIES	OCCASIONALLY	

* THIS SITE IS INCLUDED IN NEW YORK'S REGISTRY OF INACTIVE HAZARDOUS WASTE SITES, CLASSIFIED AS "UNKNOWN". THE SITE IS SCHEDULED TO BE STUDIED THIS YEAR.

LANDFILL 1

** SINCE THIS IS AN INACTIVE LANDFILL WE ARE PROVIDING A LIST OF MATERIALS TYPICALLY DISPOSED. THE BULK OF THIS MATERIAL IS NOT HAZARDOUS AND IS NOT EXPECTED TO CONTAIN HAZARDOUS CONSTITUENTS.

REF 7-1-12

1 UNIT ID as coded on your facility site map.

2 EPA Process Codes, EPA Hazardous Waste Codes from Subparts C and D and criteria constituting wastes regulated under RCRA are defined in Instr 1 DEFINITIONS of this questionnaire.

3-2 LAND DISPOSAL

3-2.2 WASTE MANAGEMENT PRACTICES

Please answer the following questions concerning waste management practices associated with the land disposal unit identified on the preceding page.

1. Were/are measures taken to divert run-on from the unit?

Yes	No	NK	COMMENT
X			LANDFILL #2 (LD-02) IS ON TOP OF LANDFILL #1 (LD-01) AT A LEVEL 12 FEET ABOVE GROUND LEVEL. THERE IS NO RUN-ON ASSOCIATED WITH THIS LANDFILL.

Description of Measures Taken:

2. Are/were bulk or non-containerized liquid wastes or wastes containing free liquid placed in the unit?

Yes	No	NK	COMMENT
X			SEE ITEM 6.

3. Were/are liners used? If yes, specify liner type.

Yes	No	NK	Liner type (e.g., clay or other liner resistant to organic compounds)/COMMENT
	X		

4. Did/does the unit have a functioning leachate collection system? Please describe.

Yes	No	NK	Description/COMMENT
	X		

5. Did/does the unit have containment and drainage control systems (e.g., protective cover)? Please describe.

Yes	No	NK	Description/COMMENT
X			UNIT IS COVERED WITH LANDFILL #2 (LD-02), WHICH IS COVERED WITH 2 FEET OF CLAY-LIKE MATERIAL (COMPOST) AND VEGETATION.

6. Are/were liquid wastes treated chemically or physically so that free liquids are/were no longer present? Specify treatment method.

Yes	No	NK	COMMENT
X			SOLVENTS WERE PLACED IN AN OPEN PIT AND BURNED. ACIDS WERE PLACED IN AN ACID PIT AND NEUTRALIZED WITH LIMESTONE. OCCASIONALLY CHEMICALS WERE DETONATED AND/OR BURNED IN THIS AREA.

[1] Unit ID as coded on your facility site map.

7.2.92

3-2 LAND DISPOSAL

3-2.2 Cont'd

7. Were/are reactive, ignitable, or incompatible wastes placed in the unit? If so, was/is the waste treated, rendered or mixed so that it no longer posed/poses a hazard? Please specify.

Yes	No	NK	If yes, mitigative treatment?	Unknown Treatment	Description/COMMENT
X					SOLVENTS WERE BURNED. ACIDS WERE NEUTRALIZED. OCCASIONALLY REACTIVE CHEMICALS MAY HAVE BEEN DETONATED OR BURNED.

8. Did/does the unit contain waste that generates methane (eg, biodegradable organics) or volatile constituents?

Yes	No	NK	If Yes, Constituents	COMMENT
X			FOOD WASTES	MINIMAL QUANTITIES.

If yes, were/are emission controls in place that would prevent gas migration from the unit? Describe the controls.

Yes	No	NK	Description/COMMENT
	X		

9. If the unit is/was a surface impoundment, are/were procedures in place to maintain at least 2 feet (60 cm) of freeboard?

Yes	No	NA	NK	COMMENT
		X		

If yes, were/are the procedures manual or automatic? Please describe.

Manual	Automatic	Procedure Description/COMMENT
		NA

7.3.12

3-2 LAND DISPOSAL

3-2.2 Cont'd

Was/is there any evidence of overtopping of the dike?

Yes	No	NK	COMMENT
___	___	___	NA

10. Were/are groundwater monitoring programs in place to detect contamination due to seepage from this unit?

		Seepage Observed?		
Yes	No	Yes	No	Comment
X	___	___	___	GROUNDWATER QUALITY IS MONITORED AT THE PROPERTY LINE (APPROXIMATELY 1000 FT. DOWNGRADIENT).

11. If not addressed above, please describe briefly any other engineered features designed to prevent releases (to groundwater, surface water, air and soil) from this unit.

NA (ADDRESSED ABOVE)

12. Structural Integrity: If there are/were any indications that releases may have occurred due to the physical condition of the unit, briefly describe the nature of the problem.

NONE

1 UNIT ID as coded on your facility site map.

7.4.12

3-2 LAND DISPOSAL

3-2.3 EVIDENCE OF RELEASE/REMEDIATION

Please provide the following information on any prior or current release of hazardous waste or hazardous waste constituents associated with the SWMU described in the preceding pages.

Evidence of Release

None	Indirect*	Positive Proof from Direct Observation	Positive Proof from Laboratory Analyses	Comment
X				

*e.g., discoloration of surrounding soil, dead vegetation

Characteristics of Release

EPA Hazardous Waste # or Waste Description [2]	Estimated Quantity or Volume Released (Units)	Date(s) of Release	Nature of Release
NA			

7.5.12

1 UNIT ID as coded on your facility site map.

2 EPA Process Codes, EPA Hazardous Waste Codes from Subparts C and D and criteria constituting wastes regulated under RCRA are defined in Part 1 DEFINITIONS of this questionnaire.

3-2 LAND DISPOSAL

3-2.3 (Cont'd)

For the SWMU described above, please provide any analytical data that may be available which would describe the nature and/or extent of environmental contamination that exists/existed as a result of release. Any information on the concentration of hazardous waste or hazardous waste constituents in contaminated soil, groundwater (GW), surface water (SW) or air should be attached. Include any information data (including groundwater monitoring data) submitted to EPA and the State under any other regulatory programs (e.g., Superfund) that concerns prior or continuing releases as described above. If any analytical data are attached for the unit, please indicate below:

GW Monitoring Data Attached	SW Analytical Data Attached	Soil Analytical Data Attached	Air Monitoring Data Attached

NA

For the prior/current release documented above please describe relevant remediation implemented or planned.

Previously Implemented Yes	No	NK	Inclusive Dates

Description/COMMENT

NA

Currently Implemented Yes	No	NK	Start Date

Description/COMMENT

NA

Planned to be Implemented Yes	No	NK	Start Date

Description/COMMENT

NA

7.6.12

1 UNIT ID as coded on your facility site map.

3-2 LAND DISPOSAL
LANDFILLS, SURFACE IMPOUNDMENTS AND/OR WASTE PILES

NOTE: COMPLETE 3-2.1 THROUGH 3-2.3 FOR EACH INDIVIDUAL LAND DISPOSAL SWMU WHICH EITHER IS CURRENTLY OR HAS PREVIOUSLY BEEN OPERATED ON YOUR SITE.

3-2.1 WASTE CHARACTERISTICS

Provide the following information regarding the wastes that are/have been stored, treated, or disposed of in the identified land disposal unit. Identify the unit according to your map identifier code and provide the appropriate EPA process code.[2] Indicate the operational status of the unit, identifying the first year of operation for active units or the inclusive dates of operation [from - to] for units presently inactive. Include the hazardous waste code from 40 CFR, Subpart D for each listed hazardous waste handled at each unit. If you handle/handled hazardous wastes which are not cited in 40 CFR, Subpart D, enter the code(s) from 40 CFR, Subpart C that describe(s) the characteristics and/or the toxic constituents of those hazardous wastes.[2] For any wastes which do not have a corresponding EPA hazardous waste number, please determine, as best you can, if the particular waste would be considered a hazardous waste or to contain hazardous waste constituent(s) under RCRA and provide waste descriptions.[2] For each waste, indicate the quantity that was/is handled on an ANNUAL basis. Provide the appropriate unit of measure (e.g., tons, cubic yards, drums or gallons). Please indicate (x) in last column if any prior or current release of hazardous waste or hazardous waste constituents was/is associated with the unit described.

SWMU TYPE/ UNIT IDENTIFIER[1]	SIZE	OPERATIONAL STATUS	EPA PROCESS CODE	EPA HAZARDOUS WASTE NO. OR WASTE DESCRIPTION[2]	ESTIMATED ANNUAL QUANTITY (SPECIFY UNITS)	ASSOCIATED RELEASE?
LD-02 *	156,000 CY	ACTIVE: ____ YEAR START: ____	D80	**		No Evidence of Release
		INACTIVE X INCLUSIVE YEARS: 1966 - 1979		INCINERATOR ASH		
				GLASS		
				DEBRIS		
				PLANT TRASH (PAPER, WOOD, CARDBOARD, METAL)	12000 CY/YR. COMPACTED VOLUME	
				VITAMINS		
				WASTEWATER TREATMENT SLUDGE		
				FERMENTATION CAKE		
				REACTIVE / EXPLOSIVE CHEMICALS	OCCASIONALLY	

LANDFILL 2

* THIS SITE IS INCLUDED IN NEW YORK'S REGISTRY OF INACTIVE HAZARDOUS WASTE SITES, CLASSIFIED AS "UNKNOWN". THE SITE IS SCHEDULED TO BE STUDIED THIS YEAR

** SINCE THIS IS AN INACTIVE LANDFILL WE ARE PROVIDING A LIST OF MATERIALS TYPICALLY DISPOSED. THE BULK OF THIS MATERIAL IS NOT HAZARDOUS AND IS NOT EXPECTED TO CONTAIN HAZARDOUS CONSTITUENTS.

1 UNIT ID as coded on your facility site map.

2 EPA Process Codes, EPA Hazardous Waste Codes from Subparts C and D and criteria constituting wastes regulated under RCRA are defined in Part 1 DEFINITIONS of this questionnaire.

7.7.12

3-2 LAND DISPOSAL

3-2.2 WASTE MANAGEMENT PRACTICES

Please answer the following questions concerning waste management practices associated with the land disposal unit identified on the preceding page.

1. Were/are measures taken to divert run-on from the unit?

Yes	No	NK	COMMENT
X			THE CLOSED LANDFILL #2 (LD-02) IS 12 FEET ABOVE GROUND LEVEL. THERE IS NO RUN-ON ASSOCIATED WITH THIS LANDFILL.

Description of Measures Taken:

2. Are/were bulk or non-containerized liquid wastes or wastes containing free liquid placed in the unit?

Yes	No	NK	COMMENT
	X		SEE ITEM 6

3. Were/are liners used? If yes, specify liner type.

Yes	No	NK	Liner type (e.g., clay or other liner resistant to organic compounds)/COMMENT
	X		

4. Did/does the unit have a functioning leachate collection system? Please describe.

Yes	No	NK	Description/COMMENT
	X		

5. Did/does the unit have containment and drainage control systems (e.g., protective cover)? Please describe.

Yes	No	NK	Description/COMMENT
X			UNIT IS COVERED WITH 2 FEET OF CLAY-LIKE MATERIAL (COMPOST) AND VEGETATION.

6. Are/were liquid wastes treated chemically or physically so that free liquids are/were no longer present? Specify treatment method.

Yes	No	NK	COMMENT
X			OCCASIONALLY LABORATORY CHEMICALS WERE DETONATED/BURNED IN THIS AREA.

[1] UNIT ID as coded on your facility site map.

7.8.12

3-2 LAND DISPOSAL

3-2.2 Cont'd

7. Were/are reactive, ignitable, or incompatible wastes placed in the unit? If so, was/is the waste treated, rendered or mixed so that it no longer posed/poses a hazard? Please specify.

Yes	No	NK	If yes, mitigative treatment?	Unknown Treatment	Description/COMMENT
	X				

8. Did/does the unit contain waste that generates methane (eg, biodegradable organics) or volatile constituents?

Yes	No	NK	If Yes, Constituents	COMMENT
X			FOOD WASTES	MINIMAL QUANTITIES

If yes, were/are emission controls in place that would prevent gas migration from the unit? Describe the controls.

Yes	No	NK	Description/COMMENT
	X		

9. If the unit is/was a surface impoundment, are/were procedures in place to maintain at least 2 feet (60 cm) of freeboard?

Yes	No	NA	NK	COMMENT
		X		

If yes, were/are the procedures manual or automatic? Please describe.

Manual	Automatic	Procedure Description/COMMENT
		NA

7.9.12

1 UNIT ID as coded on your facility site map.

3-2 LAND DISPOSAL

3-2.2 Cont'd

Was/is there any evidence of overtopping of the dike?

Yes	No	NK	COMMENT
___	___	___	NA

10. Were/are groundwater monitoring programs in place to detect contamination due to seepage from this unit?

Yes	No	Seepage Observed? Yes	Seepage Observed? No	Comment
X	___	___	___	GROUNDWATER QUALITY IS MONITORED AT THE PROPERTY LINE (APPROXIMATELY 1000 FT. DOWNGRADIENT).

11. If not addressed above, please describe briefly any other engineered features designed to prevent releases (to groundwater, surface water, air and soil) from this unit.

NA

12. Structural Integrity: If there are/were any indications that releases may have occurred due to the physical condition of the unit, briefly describe the nature of the problem.

NONE

7.10.12

1 UNIT ID as coded on your facility site map.

3-2 LAND DISPOSAL

3-2.3 EVIDENCE OF RELEASE/REMEDIATION

Please provide the following information on any prior or current release of hazardous waste or hazardous waste constituents associated with the SWMU described in the preceding pages.

Evidence of Release

None	Indirect*	Positive Proof from Direct Observation	Positive Proof from Laboratory Analyses	Comment
X				

*e.g., discoloration of surrounding soil, dead vegetation

Characteristics of Release

EPA Hazardous Waste # or Waste Description [2]	Estimated Quantity or Volume Released (Units)	Date(s) of Release	Nature of Release
NA			

7.11.12

1 UNIT ID as coded on your facility site map.

2 EPA Process Codes, EPA Hazardous Waste Codes from Subparts C and D and criteria constituting wastes regulated under RCRA are defined in Part 1 DEFINITIONS of this questionnaire.

3-2 LAND DISPOSAL

3-2.3 (Cont'd)

For the SWMU described above, please provide any analytical data that may be available which would describe the nature and/or extent of environmental contamination that exists/existed as a result of release. Any information on the concentration of hazardous waste or hazardous waste constituents in contaminated soil, groundwater (GW), surface water (SW) or air should be attached. Include any information data (including groundwater monitoring data) submitted to EPA and the State under any other regulatory programs (e.g., Superfund) that concerns prior or continuing releases as described above. If any analytical data are attached for the unit, please indicate below:

GW Monitoring Data Attached	SW Analytical Data Attached	Soil Analytical Data Attached	Air Monitoring Data Attached

NA

For the prior/current release documented above please describe relevant remediation implemented or planned.

Previously Implemented Yes	Previously Implemented No	NK	Inclusive Dates	Description/COMMENT
				NA

Currently Implemented Yes	Currently Implemented No	NK	Start Date	Description/COMMENT
				NA

Planned to be Implemented Yes	Planned to be Implemented No	NK	Start Date	Description/COMMENT
				NA

7.12.12

1 UNIT ID as coded on your facility site map.

REF 8.1.4

LEDERLE LABORATORIES

A Division of AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK 10965
AREA CODE 914 735-5000

October 3, 1985

Mr. Ramanand Pergadia
Senior Sanitary Engineer
NYSDEC, Region III
21 South Putt Corners Rd
New Paltz, NY 12561-1696

RE: Lederle Laboratories
Completed Sanitary
Landfills No. 1 and 2

Dear Mr. Pergadia,

We are in receipt of your letter requesting copies of drawings and analytical results pertaining to the reference completed Sanitary Landfills #1 and 2.

We are enclosing the 1981 "NYSDEC Project Winter" analysis report on monitoring wells sampled in the landfill area, Lederle drawing G-28555C "Test Boring Landfill Area" and monitoring well log data which is the information you requested on your plant visit of September 12, 1985.

In addition we are also enclosing a copy of the information supplied to Mr. John Parnell, of the Rockland County Department of Health. The information supplied to Mr. Parnell is the priority pollutant analysis of the ground and surface waters at the point where the waters leave the Lederle plant property. Also included is the priority pollutant analysis of the drinking water supplied to the plant by Spring Valley Water Company and the Lederle well water which is utilized for cooling in the plant.

Lederle DWG G-28555C has been highlighted to indicate both the wells that were sampled during the "Project Winter Analysis" and the wells monitoring the groundwater leaving the plant.

If you have further concerns, please contact this office.

Very truly yours,

Carlene Bassell

Carlene Bassell, P.E.
Manager, Environmental
Technology

TJR:cit
Encl.

8.2.4

ANALYTICAL REPORT

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
"PROJECT WINTER" ANALYSES

Report Date: 6/10/81

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 44S02 D02 (5/18/81)	
Total Organic Carbon	mg/l	61	
True Color	Pt-Co Units	40 X	
Odor	T.O.N.	38 X	3 Pass
Sulfate	mg/l	<2	
Total Filterable Residue (180°C)	mg/l	2,200	
pH	Standard Units	6.94	
Conductance (at 25°C)	µmhos/cm	4,230	
Total Arsenic	µg/l	5	
Total Barium	mg/l	1.1 X	1.0 mg/l
Total Cadmium	mg/l	0.003	
Total Chromium	mg/l	0.064 X	0.05 mg/l
Total Lead	mg/l	0.03	
Total Mercury	µg/l	<3	
Total Selenium	µg/l	<3	
Total Silver	mg/l	<0.003	
Total Iron	mg/l	190 X	0.3 mg/l
Total Manganese	mg/l	11 X	0.05 mg/l
Total Copper	mg/l	0.144	
Total Zinc	mg/l	0.353	
Aldrin	µg/l	<0.03	
Lindane	µg/l	<0.02	
Methoxychlor	µg/l	<0.1	
Toxaphene	µg/l	<0.5	
2,4-D	µg/l	<0.2	
2,4,5-TP (Silvex)	µg/l	<0.05	

COMMENTS: Refer to General Comments.

FOR RECRA RESEARCH, INC. Larry C. Rosengrant

DATE 6/10/81

RECRA RESEARCH, INC.

881-105C

8.3.4

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
"PROJECT WINTER" ANALYSIS

XD-12 Date: 6/10/81

80-72

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 44S02 001 (2/19/81)	44S02 002 (2/19/81)
Total Organic Carbon	mg/l	1	<1
True Color	Pt-Co Units	5.0	7.5
Odor	T.O.N.	51	<1
Sulfate	mg/l	33	120
Total Filterable Residue (180°C)	mg/l	200	360
pH	Standard Units	7.74	7.85
Conductance (at 25°C)	µmhos/cm	290	490
Total Arsenic	µg/l	<3	<3
Total Barium	mg/l	<0.1	<0.1
Total Cadmium	mg/l	0.003	<0.003
Total Chromium	mg/l	0.004	0.004
Total Lead	mg/l	<0.04	<0.04
Total Mercury	µg/l	<3	<3
Total Selenium	µg/l	<3	<3
Total Silver	mg/l	<0.003	<0.003
~~Total Iron~~	mg/l	~~0.41~~ ×	~~0.05~~ × 0.03MJ/L
~~Total Manganese~~	mg/l	~~0.26~~	~~0.075~~ × 0.05MJ/L
Total Copper	mg/l	0.016	0.008
Total Zinc	mg/l	0.058	0.052
Endrin	µg/l	-	<0.03
Lindane	µg/l	-	<0.02
Methoxychlor	µg/l	-	<0.2
Toxaphene	µg/l	-	<0.5
2,4-D	µg/l	-	<0.2
2,4,5-TP (Silvex)	µg/l	-	<0.05

COMMENTS: Sample container for organics was broken during shipment for Sample 44S02-001. Due to breakage of sample container during shipment, inorganic parameters for Sample 44S02-002 were subsampled from the corresponding organic sample bottle.

FOR ERLSA RESEARCH, INC. Larry C. Rovegno

DATE 6/10/81

ERLSA RESEARCH, INC.

ERL-105D

8.4.4.

ANALYTICAL RESULTS

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
"PROJECT WINTER" ANALYSES

Report Date: 6/10/81

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 44S02 D01 (2/19/81)	44S02 D03 (2/19/81)	44S02 D04#2 (2/19/81)
Total Organic Carbon	mg/l	53	10	7.5
True Color	Pt-Co Units	50	2.5	12.5
Odor	T.O.N.	2.4	1.4	2.0
Sulfate	mg/l	14	38	52
Total Filterable Residue (180°C)	mg/l	1,700	1,200	1,000
pH	Standard Units	7.50	6.95	6.77
Conductance (at 25°C)	µmhos/cm	3,100	1,970	1,500
Total Arsenic	µg/l	<3	<3	<3
Total Barium	mg/l	0.67	0.46	0.36
Total Cadmium	mg/l	<0.003	<0.003	0.004
Total Chromium	mg/l	0.040	<0.004	0.008
Total Lead	mg/l	<0.04	<0.04	0.05
Total Mercury	µg/l	<3	<3	<3
Total Selenium	µg/l	<3	<3	<3
Total Silver	mg/l	0.003	<0.003	<0.003
~~Total Iron~~	mg/l	[illegible]	[illegible]	[illegible]
~~Total Manganese~~	mg/l	[illegible]	[illegible]	[illegible]
Total Copper	mg/l	1.1	0.004	0.026
Total Zinc	mg/l	1.1	0.083	0.040
Endrin	µg/l	-	<0.03	<0.03
Lindane	µg/l	-	<0.02	0.03
Methoxychlor	µg/l	-	<0.1	<0.1
Toxaphene	µg/l	-	<0.5	<0.5
2,4-D	µg/l	-	<0.2	<0.2
2,4,5-TP (Silvex)	µg/l	-	<0.05	<0.05

COMMENTS: Sample container for organics was broken during shipment for Sample 44S02-D01.

FOR [illegible] RESEARCH, INC. [signature]

DATE 6/10/81

RA RESEARCH INC
I.D. #81-105D

REF 9.1.1

Telephone Conversation Record

Date: 3/30/88

Time: 11:30 A.M.

Call by: J. Sanghvi (Name) of Gibbs & Hill, Inc. (Company)

Answer by: Climent Destimore (Name) of Highway Dept., Orangrtown (Company)
(914) 359-5100

Contract No: 5019-210

Subject discussed: Use of Muddy Creek Within 3 Miles Downstream of the Site.

SUMMARY OF DISCUSSION, DECISIONS AND COMMITMENTS.

Mr. Destimore of Highway Department, town of Orangetown informed me that Muddy Creek is not currently being used for fishing or any other recreational activity.

F-424, 10-68

10-1-1

Telephone Conversation Record

Date: 5/24/88

Time: 1:55 P.M.

Call by: Paul Trader (Name) of Cornell Extension Cooperative (Company)

Answer by: J. Sanghvi (Name) of Gibbs & Hill, Inc. (Company)

Contract No: 5019-210

Subject discussed: Irrigated, Agricultural, & Prime Agricultural Land for Lederle Lab. Site

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SUMMARY OF DISCUSSION, DECISIONS AND COMMITMENTS.

Mr. Trader returned my call
I Received the following information

-Land area irrigated within 3 mile radius of the site.

Answer - None

-Distance to agricultural land in production within past 5 years, if 1 mile or less.

Answer - None

-Distance to prime agricultural land in production within past 5 years, if 2 mile or less.

Answer - None.

F-424, 10-68

LEDERLE LAB. SITE
USGS House Count
(See attached diagram)

	1 mile (A)	2 mile (B)	3 mile (C)
I	301	741	150
II	51	241	447
III	189	309	322
IV	56	345	156
	597	1636	1075
	x3.8	x3.8	x3.8
	2269	6217	4085

Total Population:

1 mile	2 mile	3 mile
2269	8486	12571

Population Count

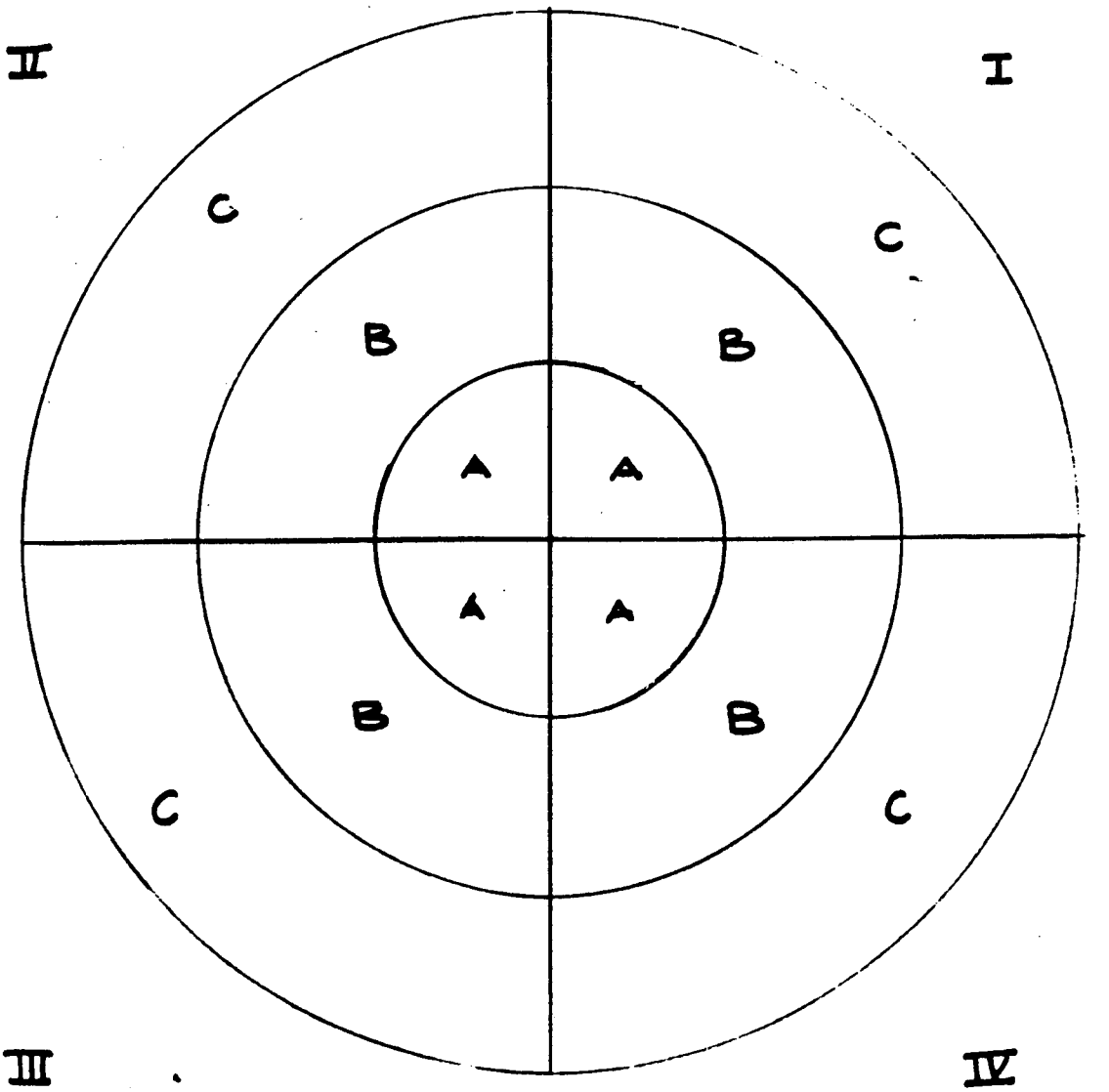
Population within 3 mile radius of each Phase I site is determined using the coordinates system illustrated below. The number of residences for each quadrant and section is determined by overlaying this pattern onto a USGS 7.5 minute topographic map. A multiplier of 3.8 persons per residence is used to determine population in accordence with Mitre Model 1985.

A = 1 Mile radius

B = 2 Mile radius

C = 3 Mile radius

(Figure not To Scale)



5.5 EPA 2070-13

Site Inspection Report

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NYD	054065909

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Lederle Laborarories	Middletown Road

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Pearl River	NY		Rockland		

09 COORDINATES LATITUDE	LONGITUDE
41 04 30.0	74 01 33.0

10 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
08 / 06 / 87 (MONTH DAY YEAR)	☐ ACTIVE ☒ INACTIVE	1946 (BEGINNING YEAR) 1979 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☒ F. STATE CONTRACTOR Gibbs & Hill (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Thomas Propersi	Project Manager	G & H	(212) 216-7216
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Leah Radko	Asst. Engineer	G & H	(212) 216 6107
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Carlene D. Bassell	Manager	Lederle Labs. Pearl River, N Y 10965	(914) 732-2500
Richard Guterl	Manager	"	(914) 732-5000
Russell G. Slayback	President	Leggette, Bashears & Graham 72 Danbury Rd. Wilton CT 06897	(203) 762-1207
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	10:00 AM	Cloudy, Raening, Warm, Humid

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Gibbs & Hill, Inc.		( )

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Propersi/Radko		G & H	(212) 216-7216	8 6 87 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NYD	054065909

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☒ A. SOLID
- ☐ B. POWDER, FINES
- ☒ C. SLUDGE
- ☐ D. OTHER Incin. Ash (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS 677,800 *

CUBIC YARDS ____

NO. OF DRUMS ____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☒ G. FLAMMABLE
- ☒ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	*	Tons	Items listed to the left are
OLW	OILY WASTE	*	Tons	included in the total quantity
SOL	SOLVENTS	*	Tons	of process waste landfilled
PSD	PESTICIDES			Exact quantity of each are not
OCC	OTHER ORGANIC CHEMICALS	*	Tons	known.
IOC	INORGANIC CHEMICALS			
ACD	ACIDS	*	Tons	
BAS	BASES			
MES	HEAVY METALS	*	Tons	

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	Arsenic		Landfilled	Not Known	
	Selenium				
	Antimony				
	Mercury				
	Iron				
	Manganese				
	Zinc, Cadmium, Copper				
	Chromium				
	Lead				
	Organics				
	Other solvents nonpolar				
	Oils & Sludges				
	Alcohols, Salts				
	Pharmaceutical Wastes				
	Paints & Pigments				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Lederle Labs. Files, NYSDEC Files

* Process for the period 1946-1979. Percentage of Hazardous Waste is not known

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NYD	054065909

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 240541 — 04 NARRATIVE DESCRIPTION

11 Community municipal wells mixing with numerous community wells. Outside of a three mile radius serving one water company with 227,900 customers + one non-community municipal well servong 70 persons

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 0 — 04 NARRATIVE DESCRIPTION

No surface water intakes within 3 miles downstream of the sites

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 0 — 04 NARRATIVE DESCRIPTION

No quantitative data available, but material is landfilled

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 27 — 04 NARRATIVE DESCRIPTION

27 persons based on 3.8 persons/dwelling in the 7 closest dwelling. Fire/Explosion potential based on ignitability of oils.

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Not likely. Landfill is covered

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: Not known (Acres) — 04 NARRATIVE DESCRIPTION

Landfill is not listed.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 240,541 — 04 NARRATIVE DESCRIPTION

Based on potential groundwater contamination (As above)

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Not likely. Landfill is covered

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 240,541 — 04 NARRATIVE DESCRIPTION

Numbers of persons drinking from wells

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: NYD | 02 SITE NUMBER: 054065909

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential exists if wastes enter creek

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

Potential exists if wastes enter creek

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential exists if wastes enter creek

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 240,541
04 NARRATIVE DESCRIPTION

Number of persons drinking from wells and in the 7 closest dwelling
(Fire and Explosion)

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Not likely

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

N/A

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Site visit, Interview, USGS park ridge quad., NYC atlas of community water system sources, DEC files, Facility files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NYD	054065909

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				Air-392400-0095
☒ G. STATE (Specify)				Compost-0680
☐ H. LOCAL (Specify)				Landfill-0668 or 0713
☐ I. OTHER (Specify)				Petro. Storage-03 2560
☐ J. NONE				SPDEC-0004600

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☒ F. LANDFILL	* 677,800	Tons
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- ☒ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☒ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER

☐ A. BUILDINGS ON SITE

Lederle compex begins 0.11 miles

06 AREA OF SITE

12 (Acres)

07 COMMENTS

* Total quantity of process waste landfilled during the period 1946-1979. Percentage of hazardous waste is not known.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☒ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

No containment. Material is landfilled.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES ☒ NO

02 COMMENTS

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Facility files, NYSDEC files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NYD	054065909

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL
COMMUNITY	A. ☐	B. ☒
NON-COMMUNITY	C. ☐	D. ☒

02 STATUS	ENDANGERED	AFFECTED	MONITORED
	A. ☐	B. ☐	C. ☒
	D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE
A. 0.95 (mi)
B. 2.5 (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☒ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 240,541

03 DISTANCE TO NEAREST DRINKING WATER WELL 0.95 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
0 (ft)	Southeast	24 (ft)	381,600 (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

On-site wells at Lederle Labs are used for cooling purposes.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☒ NO	COMMENTS: Overlying till impedes downward perlocation.	☐ YES ☐ NO	COMMENTS:

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☐ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☒ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Muddy Creek	☐	50 Feet (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 19,269 NO. OF PERSONS	B. > 58,000 NO. OF PERSONS	C. 12,571 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION: 0.33 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE: 15,388

04 DISTANCE TO NEAREST OFF-SITE BUILDING: 0.11 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NYD	054065909

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☒ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one) Variable, site bedrock yeilds vary from 20 to 265 GPM

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
24 (ft)	Unknown (ft)	Unknown	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
19.8 (in)	2.75 (in)	8 %	East	8 %

09 FLOOD POTENTIAL
SITE IS IN Unknown YEAR FLOODPLAIN

10
No ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE	OTHER
A. N/A (mi)	B. N/A (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)
N/A (mi)
ENDANGERED SPECIES: N/A

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. 0.47 (mi)	B. N/A (mi)	C. N/A (mi)	D. N/A (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Site is situated in creek valley with higher elevation to the west and east.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

USGS Park Ridge Quad.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NYD	054065909

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER x		GW samples had been taken at Laderle Labs request over many years.	—
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Lederle Labs / selected photos sent to G & H
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Gibbs & Hill, Inc.

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Facility files, NYSDEC files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NYD	054065909

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Lederle Laboratories		Middletown Road		Pearl River	NY	10965

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	12 CITY	13 STATE	14 ZIP CODE
American Cyanamid Co.		1 Cyanamid Plaza		Wayne	NJ	07470

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Same As Above.						

IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Facility files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NYD	054065909

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
Lederle Laboratories	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
Middletown Road	

05 CITY	06 STATE	07 ZIP CODE
Pearl River	NY	10965

08 YEARS OF OPERATION	09 NAME OF OWNER
1907-Pres.	

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER
American Cyanamid Co.	

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
1 Cyanamid Plaza	

14 CITY	15 STATE	16 ZIP CODE
Wayne	NJ	07470

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER
Same As Above	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER
N/A	

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Facility files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NYD	054065909

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
Lederle Laboratories	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
Middletown Road	

05 CITY	06 STATE	07 ZIP CODE
Pearl River	NY	10965

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Clarkstown Police Dept.			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
Clarkstown	NY				

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Rockland Research Institute			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Clarkstown P. D.			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
Clarkstown	NY				

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Rockland Research Instit.			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NYD	054065909

II. PAST RESPONSE ACTIVITIES Non Reported

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION Non Reported

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NYD	054065909

II PAST RESPONSE ACTIVITIES *(Continued)* Non Reported

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Non Reported

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NYD	054065909

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

NYSDEC files.

6. RECOMMENDATION

6.1 Adequacy of Existing Data

The existing data are adequate to indicate that hazardous wastes were deposited at the site and could have possibly migrated to the groundwater and surface water. Groundwater and surface water samples showed contamination but test results varied over time and were typically not specific to the site of concern. More data from upgradient and downgradient monitoring wells and upstream surface water should be collected to verify that the site is indeed a source and if so, to what extent. In addition, a complete HRS score cannot be prepared until air samples from the site have been collected and analyzed.

6.2 Recommendation

It is recommended that a Phase II investigation be performed at this site. Groundwater contamination downgradient of the site may be the result of hazardous wastes known to have been deposited at the site. However, contamination cannot, at this time, be specifically attributed to the site due to a lack of relevant sampling data and the unknown effects of two other adjacent landfills.

APPENDIX A

APPENDIX A
Bibliography

A-1 Site Photographs.

A-2 Thomas J. Reilly (Lederle Laboratories) Letter to Richard Gardineer (NYS DEC), 10/30/81.

A-3 Land Disposal, Landfills, Surface Impoundments and/or Waste Piles, Lederle Laboratories.

A-4 NYS DEC Facility Inspection Reports, Lederle, 1979-1980.

A-5 Bob Eckhardt, Subcommittee on Oversight and Investigations Report.

A-6 Thomas J. Reilly (Lederle Laboratories) Letter to John T. Parnell (Rockland County Department of Health), 10/2/85 with Sample Results.

A-7 Lederle Laboratories, Test Borings Landfill Area, 9/13/85.

A-8 Rockland County Department of Health, Inspection Report, 11/21/79.

A-9 Perlmutter, N. Geology and Ground-Water Resources of Rockland County, New York, USGS Bulletin GW-42, 1959.

A-10 Lederle Laboratories, Ground-Water Flow Map.

A-11 Carlene Bassell (Lederle Laboratories) Letter to Ramanand Pergadia (NYS DEC), 10/3/85.

A-12 CompuChem Laboratories NC, Sample Results, 5/14/87.

LATE 1946

PHOTO # 1

8/27/54

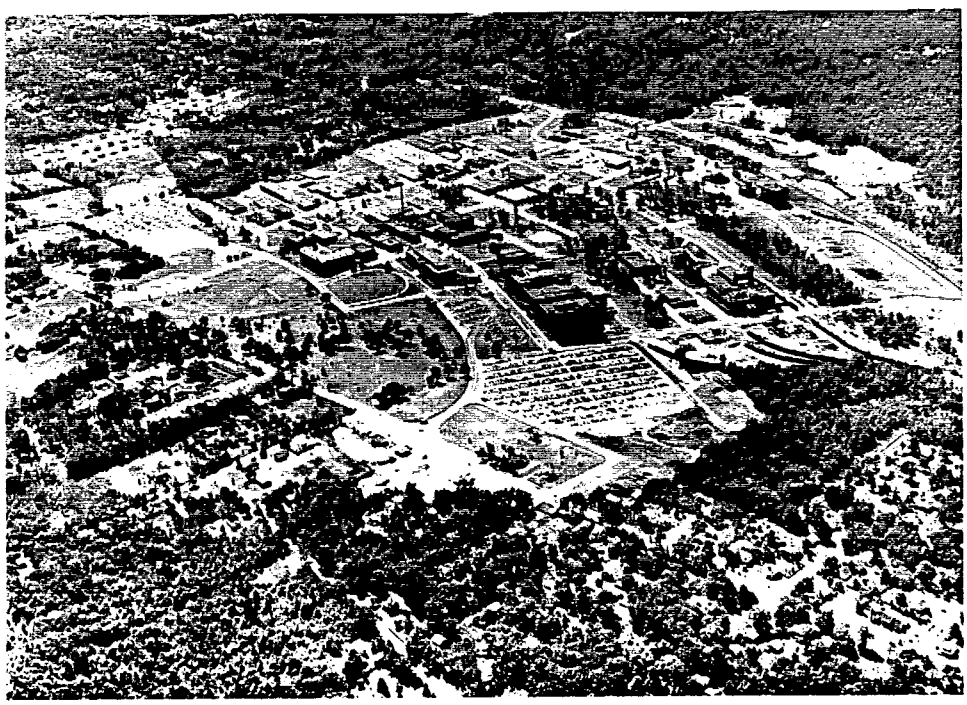


PHOTO # 2

1964-68

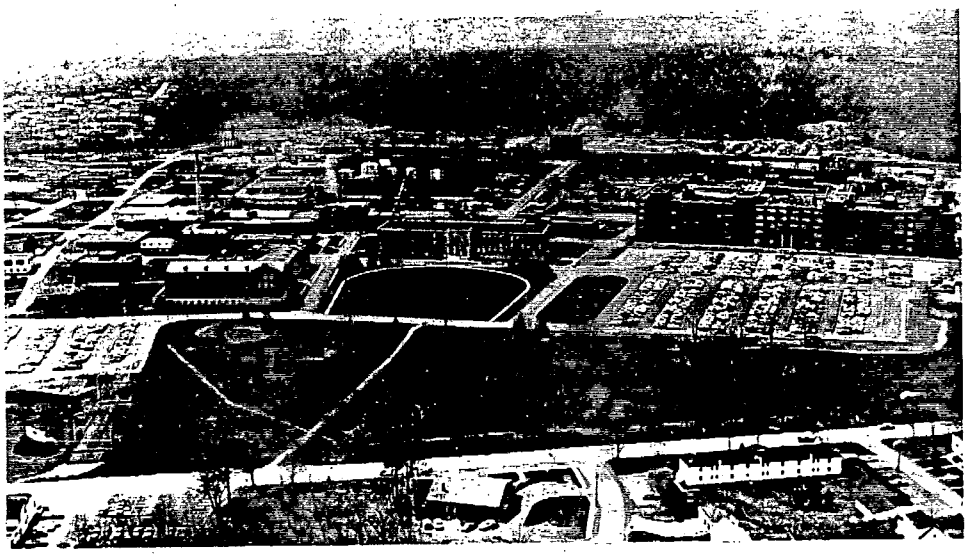


PHOTO # 3

1986

PHOTO # 4

PHOTO # 5

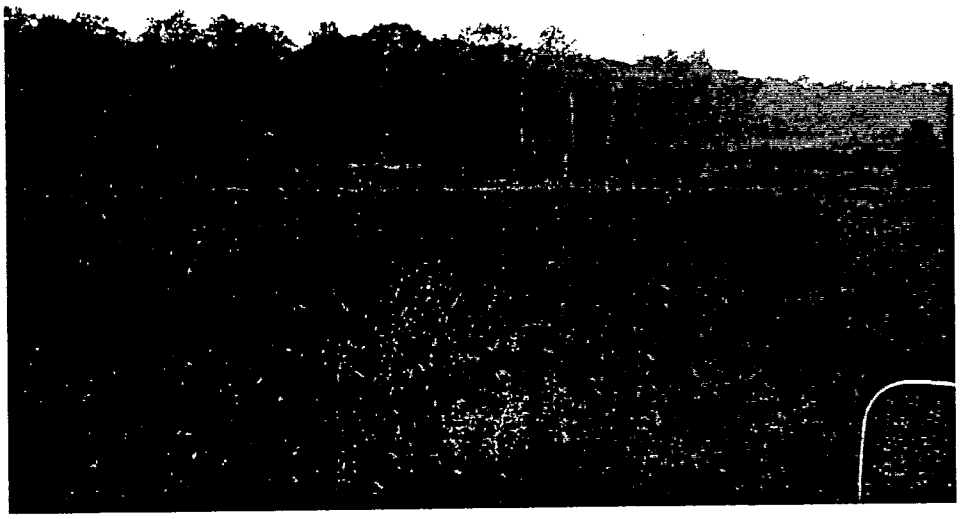


PHOTO # 6

PHOTO # 7

A-2.1.9

LEDERLE LABORATORIES

A Division of AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK 10965
AREA CODE 914 735-5000

October 30, 1981

Mr. Richard Gardineer, P. E.
Senior Sanitary Engineer
New York State Department of Environmental Conservation
202 Mamaroneck Avenue
White Plains, NY 10601

RE: Renewal of Sanitary Landfill Area 2A
Operation Permit Number 0532

Dear Mr. Gardineer:

Enclosed, please find the original and two copies of The New York State Department of Environmental Conservation "Application for approval to operate a Solid Waste Management Facility" and three (3) copies of the "Report on Sanitary Landfill Area 2A Operation and Plans". A check for the $100.00 renewal fee is also enclosed.

"Attachments to this Permit Renewal Application are submitted in two parts: a main section and a collateral confidential section to which reference is made in the main section. The confidential section is enclosed separately in a sealed envelope bearing the legend, 'CONFIDENTIAL INFORMATION OF AMERICAN CYANAMID COMPANY'. In sum, the enclosed confidential section makes a business confidentiality claim and requests confidential treatment."

If you have questions regarding this submission, please contact this office. Thank you for your consideration.

Very truly yours,

Thomas J. Reilly, P.E.
Head
Environmental Control
Department

TJR:kad

enclosure

cc: Mr. John Parnell, P.E.
Solid Waste Engineer
Rockland County Department of Health
Pomona, New York 10970

A-2.2.9

MAIN INFORMATION SECTION
OF
AMERICAN CYANAMID COMPANY

LEDERLE LABORATORIES DIVISION
OF
AMERICAN CYANAMID COMPANY
PEARL RIVER, NY 10965

RENEWAL APPLICATION AND REPORT ON SANITARY LANDFILL AREA 2A OPERATION AND PLANS

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
OPERATION PERMIT NUMBER 0532

10/30/81

Copy Number 3

Report By: T. J. Reilly, P.E.

Date: October 1981

Approved By:

A. L. Smith
Plant Manager

2.2 b (2) - (continued)

The percent distribution has been developed from existing daily records. The solid wastes deposited in the sanitary landfill are estimated to be approximately 10,000 to 15,000 cubic yards per year (loose volume).

C. Calculated Life of Facility

Utilizing the recommended Sanitary Landfill techniques (area, trench and ramp slope) at a rate of 7 tons of material per day, the expected life of the sanitary landfill site #2A is 1 year.

2.2 b (3) - Environmental Impact Statement

The Lederle landfill has been in use since the 1920's. The landfill area ends in rising slopes to the West which are tree covered and provide an excellent buffer. In the early years of operation, the landfill was brought to a common grade utilizing fill and cover techniques very similar to the "open area" landfill operations of today. A major drainage system was installed during the early 1950's on the East boundary of the landfill to maintain proper surface flow from the total Lederle area. In the mid 1960's a managed landfill operation was begun in the area. The word "managed" is used here primarily to indicate that at this point in time, final grades of the landfill program and direction of the work progress were established. The managed landfill operation continues today using the open area-ramp method. No probelms have been experienced with the landfill operation.

The long range plans for the development of this area include a road network, drainage, utilities and buildings as further plant expansion may be justified.

Cost Data: Refer to collateral confidential section

Incineration can account for only 60% of the materials currently deposited in the landfill area. Incinerator ash plus 40% essentially non burnables will amount to a volume in excess of 4,000 to 6,000 cubic yards per year that will require land burial as above. Preliminary costs for an additional twenty ton per day plant incinerator are estimated to be currently in excess of $1,000,000. "Clean" type acceptable wastes such as scrap metal, metal drums, fiber drums, cardboard and certain production materials are currently removed through contract disposal and sale for recycle or reuse. The materials disposed in the sanitary landfill are the types currently not amenable for recycling or reuse due to economic or environmental concerns.

ANALYSIS FOR METALS, CYANIDES AND PHENOLS
American Cyanamid - Lederle Laboratory
June 1981 - By Radian Corporation

POLLUTANT*	DETECTION LIMIT mg/L	PEARL BROOK (MUDDY CREEK) mg/L	MONITORING WELL AT SOUTH PROPERTY LINE 81-1 mg/L	MONITORING WELL AT SOUTH PROPERTY LINE 81-A mg/L	MONITORING WELL AT SOUTH PROPERTY LINE 81-C mg/L
Antimony	0.005	L 0.005	L 0.005	L 0.005	L 0.005
Arsenic	0.003	L 0.003	L 0.003	L 0.003	L 0.003
Beryllium	0.001	L 0.001	L 0.001	L 0.001	L 0.001
Cadmium	0.008	L 0.008	L 0.008	L 0.008	L 0.008
Chromium	0.001	0.018	0.014	0.010	0.006
Copper	0.001	0.045	0.004	L 0.001	0.056
Lead	0.004	0.011	L 0.004	0.016	0.008
Mercury	0.0002	L 0.0002	L 0.0002	0.0045	0.002
Nickel	0.003	0.037	0.042	0.080	0.069
Selenium	0.004	L 0.004	L 0.004	L 0.004	L 0.004
Silver	0.001	L 0.001	L 0.001	L 0.001	L 0.001
Thallium	0.003	L 0.003	L 0.003	L 0.003	L 0.003
Zinc	0.003	0.094	0.053	0.12	0.067
Cyanide	0.020	0.027	0.058	0.126	0.027
Phenols	0.005	L 0.005	L 0.005	L 0.005	0.015

* As published in the May 19, 1979 Federal Register

(Note: L = Less Than)

A-2.4.9

ANALYSES FOR PART C POLLUTANTS
B. ORGANIC SPECIES
AMERICAN CYANAMID - LEDERLE LABORATORIES
June 1981 - By Radian Corporation

	CONCENTRATION, Mg/L			
	MONITORING WELL AT SOUTH PROPERTY LINE 81-A	MONITORING WELL AT SOUTH PROPERTY LINE 81-1	MONITORING WELL AT SOUTH PROPERTY LINE 81-C	PEARL BROOK (MUDDY CREEK)
I. GC-MS Fraction - Volatile Compounds				
Benzene	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND
Chloroform	ND	D	D	ND
1,1-Dichloroethane	ND	ND	ND	ND
Methylene Chloride	ND	29.0*	D	6.7*
Toluene	ND	ND	D	ND
1,1,1-Trichloroethane	ND	D	ND	ND
Trichloroethylene	ND	D	D	ND
II. GC-MS Fraction-Acid Compounds				
2-Nitrophenol	D	ND	ND	ND
Phenol	0.042	ND	ND	ND
III. GC-MS Fraction-Base/Neutral Compounds				
bis(2-Ethylhexyl)phthalate	D	D	ND	D
1,4-Dichlorobenzene	ND	ND	ND	ND
Diethylphthalate	ND	ND	D	D
Di-n-butyl phthalate	D	D	D	D
Naphthalene	ND	ND	ND	ND
Phenanthrene/Anthracene	D	ND	ND	ND
IV. GC-MS Fraction Pesticides	No Species Detected			

[1]As it appears in the May 19, 1980, Federal Register.
[2]These compounds are indistinguishable under the conditions employed.
*Determined by direct aqueous injection.

ND- Not Detected
D-- Detected, but quantity too small to quantify
Per Mr. Tom Blair (Radian Corporation)-(512) 454-4797

A-2-5-9

A-2-6-9

LEDERLE LABORATORIES

A Division of AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK 10965
AREA CODE 914 735-5000

October 30, 1981

Mr. Richard Gardineer, P. E.
Senior Sanitary Engineer
New York State Department of Environmental Conservation
202 Mamaroneck Avenue
White Plains, NY 10601

RE: Renewal of Sanitary Landfill Area 3
Operation Permit Number 0532

Dear Mr. Gardineer:

Enclosed, please find the original and two copies of The New York State Department of Environmental Conservation "Application for approval to operate a Solid Waste Management Facility" and three (3) copies of the "Report on Sanitary Landfill Area 3 Operation and Plans". A check for the $100.00 renewal fee is also enclosed.

"Attachments to this Permit Renewal Application are submitted in two parts: a main section and a collateral confidential section to which reference is made in the main section. The confidential section is enclosed separately in a sealed envelope bearing the legend, 'CONFIDENTIAL INFORMATION OF AMERICAN CYANAMID COMPANY'. In sum, the enclosed confidential section makes a business confidentiality claim and requests confidential treatment."

If you have questions regarding this submission, please contact this office. Thank you for your consideration.

Very truly yours,

Thomas J. Reilly, P.E.
Head
Environmental Control
Department

TJR:kad

enclosure

cc: Mr. John Parnell, P.E.
Solid Waste Engineer
Rockland County Department of Health
Pomona, New York 10970

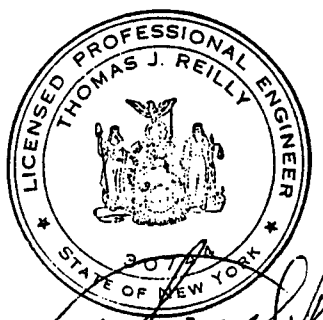
A-2.7.9

MAIN INFORMATION SECTION
OF
AMERICAN CYANAMID COMPANY

LEDERLE LABORATORIES DIVISION
OF
AMERICAN CYANAMID COMPANY
PEARL RIVER, NY 10965

RENEWAL APPLICATION AND REPORT ON SANITARY LANDFILL AREA 3 OPERATION AND PLANS

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
OPERATION PERMIT NUMBER 0532



10/30/81

Copy Number 1

Report By: T. J. Reilly, P.E.

Date: October 1981

Approved By:

A. L. Smith
Plant Manager

2-1. ANALYSIS FOR METALS, CYANIDES AND PHENOLS
American Cyanamid - Lederle Laboratory
June 1981 By Radian Corporation

POLLUTANT	DETECTION LIMIT	PEARL BROOK (Muddy Creek) PB	MONITORING WELL AT SOUTH PROPERTY LINE 81-1	MONITORING WELL AT SOUTH PROPERTY LINE 81-A	MONITORING WELL AT SOUTH PROPERTY LINE 81-C
1M Antimaony	0.005	0.005	0.005	0.005	0.005
2M Arsenic	0.003	0.003	0.003	0.003	0.003
3M Beryllium	0.001	0.001	0.001	0.001	0.001
4M Cadmium	0.008	0.008	0.008	0.008	0.008
5M Chromium	0.001	0.018	0.014	0.010	0.006
6M Copper	0.001	0.045	0.004	0.001	0.056
7M Lead	0.004	0.011	0.004	0.016	0.008
8M Mercury	0.0002	0.0002	0.0002	0.0045	0.002
9M Nickel	0.003	0.037	0.042	0.080	0.069
10M Selenium	0.004	0.004	0.004	0.004	0.004
11M Silver	0.001	0.001	0.001	0.001	0.001
12M Thallium	0.003	0.003	0.003	0.003	0.003
13M Zinc	0.003	0.094	0.053	0.12	0.067
14M Cyanide	0.020	0.027	0.058	0.126	0.027
15M Phenols	0.005	0.005	0.005	0.005	0.015

As published in the May 19, 1979, Federal Register

2-2 ANALYSES FOR PART C POLLUTANTS
B. ORGANIC SPECIES
AMERICAN CYANAMID - LEDERLE LABORATORIES
June 1981 - By Radian Corporation

	CONCENTRATION, Mg/L			
	MONITORING WELL AT SOUTH PROPERTY LINE 81-A	MONITORING WELL AT SOUTH PROPERTY LINE 81-1	MONITORING WELL AT SOUTH PROPERTY LINE 81-C	PEARL BROOK (MUDDY CREEK)
I. GC-MS Fraction - Volatile Compounds				
Benzene	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND
Chloroform	ND	D	D	ND
1,1-Dichloroethane	ND	ND	ND	ND
Methylene Chloride	ND	29.0*	D	6.7*
Toluene	ND	ND	D	ND
1,1,1-Trichloroethane	ND	D	ND	ND
Trichloroethylene	ND	D	D	ND
II. GC-MS Fraction-Acid Compounds				
2-Nitrophenol	D	ND	ND	ND
Phenol	0.042	ND	ND	ND
III. GC-MS Fraction-Base/Neutral Compounds				
bis(2-Ethylhexyl)phthalate	D	D	ND	D
1,4-Dichlorobenzene	ND	ND	ND	ND
Diethylphthalate	ND	ND	D	D
Di-n-butyl phthalate	D	D	D	D
Naphthalene	ND	ND	ND	ND
Phenanthrene/Anthracene	D	ND	ND	ND
IV. GC-MS Fraction Pesticides	No Species Detected			

[1]As it appears in the May 19, 1980, Federal Register.
[2]These compounds are indistinguishable under the conditions employed.
*Determined by direct aqueous injection.

3-2 LAND DISPOSAL
LANDFILLS, SURFACE IMPOUNDMENTS AND/OR WASTE PILES

NOTE: COMPLETE 3-2.1 THROUGH 3-2.3 FOR EACH INDIVIDUAL LAND DISPOSAL SWMU WHICH EITHER IS CURRENTLY OR HAS PREVIOUSLY BEEN OPERATED ON YOUR SITE.

3-2.1 WASTE CHARACTERISTICS

Provide the following information regarding the wastes that are/have been stored, treated, or disposed of in the identified land disposal unit. Identify the unit according to your map identifier code and provide the appropriate EPA process code.[2] Indicate the operational status of the unit, identifying the first year of operation for active units or the inclusive dates of operation (from - to) for units presently inactive. Include the hazardous waste code from 40 CFR, Subpart D for each listed hazardous waste handled at each unit. If you handle/handled hazardous wastes which are not cited in 40 CFR, Subpart D, enter the code(s) from 40 CFR, Subpart C that describe(s) the characteristics and/or the toxic constituents of those hazardous wastes.[2] For any wastes which do not have a corresponding EPA hazardous waste number, please determine, as best you can, if the particular waste would be considered a hazardous waste or to contain hazardous waste constituent(s) under RCRA and provide waste descriptions.[2] For each waste, indicate the quantity that was/is handled on an ANNUAL basis. Provide the appropriate unit of measure (e.g., tons, cubic yards, drums or gallons). Please indicate (x) in last column if any prior or current release of hazardous waste or hazardous waste constituents was/is associated with the unit described.

SWMU TYPE/ UNIT IDENTIFIER[1]	SIZE	OPERATIONAL STATUS	EPA PROCESS CODE	EPA HAZARDOUS WASTE NO. OR WASTE DESCRIPTION[2]	ESTIMATED ANNUAL QUANTITY (SPECIFY UNITS)	ASSOCIATED RELEASE?
LD-01 *	89,000 CY	ACTIVE: ____ YEAR START: ____	D80	**		NO EVIDENCE OF RELEASE
		INACTIVE X INCLUSIVE YEARS: 1946 - 1966 EXCEPT AS NOTED BELOW LANDFILL 1		INCINERATOR ASH		
				GLASS		
				DEBRIS		
				PLANT TRASH (PAPER WOOD, CARDBOARD, METAL)	4450 CY/YR. COMPACTED VOLUME	
				VITAMINS		
				WASTEWATER TREATMENT SLUDGE		
				FERMENTATION CAKE		
		1946 TO APPROX. 1962		SOLVENTS / OPEN BURNING	12,500 GAL/YR. FOR 16 YRS.	
		1946 TO APPROX. 1962		ACIDS / LIMESTONE NEUTRALIZATION	60 GAL/YR. FOR 16 YRS.	
				REACTIVE/EXPLOSIVE CHEMICALS FROM LABORATORIES	OCCASIONALLY	

* THIS SITE IS INCLUDED IN NEW YORK'S REGISTRY OF INACTIVE HAZARDOUS WASTE SITES, CLASSIFIED AS "UNKNOWN". THE SITE IS SCHEDULED TO BE STUDIED THIS YEAR.

** SINCE THIS IS AN INACTIVE LANDFILL WE ARE PROVIDING A LIST OF MATERIALS TYPICALLY DISPOSED. THE BULK OF THIS MATERIAL IS NOT HAZARDOUS AND IS NOT EXPECTED TO CONTAIN HAZARDOUS CONSTITUENTS.

1 UNIT ID as coded on your facility site map.

2 EPA Process Codes, EPA Hazardous Waste Codes from Subparts C and D and criteria constituting wastes regulated under RCRA are defined in Part 1 DEFINITIONS of this questionnaire.

A-3-1-12

3-2 LAND DISPOSAL

3-2.2 WASTE MANAGEMENT PRACTICES

Please answer the following questions concerning waste management practices associated with the land disposal unit identified on the preceding page.

1. Were/are measures taken to divert run-on from the unit?

Yes	No	NK	COMMENT
X			LANDFILL #2 (LD-02) IS ON TOP OF LANDFILL #1 (LD-01) AT A LEVEL 12 FEET ABOVE GROUND LEVEL. THERE IS NO RUN-ON ASSOCIATED WITH THIS LANDFILL.

Description of Measures Taken:

2. Are/were bulk or non-containerized liquid wastes or wastes containing free liquid placed in the unit?

Yes	No	NK	COMMENT
X			SEE ITEM 6.

3. Were/are liners used? If yes, specify liner type.

Yes	No	NK	Liner type (e.g., clay or other liner resistant to organic compounds)/COMMENT
	X		

4. Did/does the unit have a functioning leachate collection system? Please describe.

Yes	No	NK	Description/COMMENT
	X		

5. Did/does the unit have containment and drainage control systems (e.g., protective cover)? Please describe.

Yes	No	NK	Description/COMMENT
X			UNIT IS COVERED WITH LANDFILL #2 (LD-02), WHICH IS COVERED WITH 2 FEET OF CLAY-LIKE MATERIAL (COMPOST) AND VEGETATION.

6. Are/were liquid wastes treated chemically or physically so that free liquids are/were no longer present? Specify treatment method.

Yes	No	NK	COMMENT
X			SOLVENTS WERE PLACED IN AN OPEN PIT AND BURNED. ACIDS WERE PLACED IN AN ACID PIT AND NEUTRALIZED WITH LIMESTONE. OCCASIONALLY CHEMICALS WERE DETONATED AND/OR BURNED IN THIS AREA.

[1] UNIT ID as coded on your facility site map.

D-2.2.12

3-2 LAND DISPOSAL

3-2.2 Cont'd

7. Were/are reactive, ignitable, or incompatible wastes placed in the unit? If so, was/is the waste treated, rendered or mixed so that it no longer posed/poses a hazard? Please specify.

Yes	No	NK	If yes, mitigative treatment?	Unknown Treatment	Description/COMMENT
X					SOLVENTS WERE BURNED. ACIDS WERE NEUTRALIZED. OCCASIONALLY REACTIVE CHEMICALS MAY HAVE BEEN DETONATED OR BURNED.

8. Did/does the unit contain waste that generates methane (eg, biodegradable organics) or volatile constituents?

Yes	No	NK	If Yes, Constituents	COMMENT
X			FOOD WASTES	MINIMAL QUANTITIES.

If yes, were/are emission controls in place that would prevent gas migration from the unit? Describe the controls.

Yes	No	NK	Description/COMMENT
	X		

9. If the unit is/was a surface impoundment, are/were procedures in place to maintain at least 2 feet (60 cm) of freeboard?

Yes	No	NA	NK	COMMENT
		X		

If yes, were/are the procedures manual or automatic? Please describe.

Manual	Automatic	Procedure Description/COMMENT
		NA

A-3.3.12

1 UNIT ID as coded on your facility site map.

3-2 LAND DISPOSAL

3-2.2 Cont'd

Was/is there any evidence of overtopping of the dike?

Yes	No	NK	COMMENT
			NA

10. Were/are groundwater monitoring programs in place to detect contamination due to seepage from this unit?

		Seepage Observed?		
Yes	No	Yes	No	Comment
X				GROUNDWATER QUALITY IS MONITORED AT THE PROPERTY LINE (APPROXIMATELY 1000 FT. DOWNGRADIENT).

11. If not addressed above, please describe briefly any other engineered features designed to prevent releases (to groundwater, surface water, air and soil) from this unit.

NA (ADDRESSED ABOVE)

12. Structural Integrity: If there are/were any indications that releases may have occurred due to the physical condition of the unit, briefly describe the nature of the problem.

NONE

1 UNIT ID as coded on your facility site map.

A-3.4.12

4511b

3-2 LAND DISPOSAL

3-2.3 EVIDENCE OF RELEASE/REMEDIATION

Please provide the following information on any prior or current release of hazardous waste or hazardous waste constituents associated with the SWMU described in the preceding pages.

Evidence of Release

None	Indirect*	Positive Proof from Direct Observation	Positive Proof from Laboratory Analyses	Comment
X				

*e.g., discoloration of surrounding soil, dead vegetation

Characteristics of Release

EPA Hazardous Waste # or Waste Description [2]	Estimated Quantity or Volume Released (Units)	Date(s) of Release	Nature of Release
NA			

A-3.5.12

1 UNIT ID as coded on your facility site map.

2 EPA Process Codes, EPA Hazardous Waste Codes from Subparts C and D and criteria constituting wastes regulated under RCRA are defined in Part 1 DEFINITIONS of this questionnaire.

3-2 LAND DISPOSAL

3-2.3 (Cont'd)

For the SWMU described above, please provide any analytical data that may be available which would describe the nature and/or extent of environmental contamination that exists/existed as a result of release. Any information on the concentration of hazardous waste or hazardous waste constituents in contaminated soil, groundwater (GW), surface water (SW) or air should be attached. Include any information data (including groundwater monitoring data) submitted to EPA and the State under any other regulatory programs (e.g., Superfund) that concerns prior or continuing releases as described above. If any analytical data are attached for the unit, please indicate below:

GW Monitoring Data Attached	SW Analytical Data Attached	Soil Analytical Data Attached	Air Monitoring Data Attached

NA

For the prior/current release documented above please describe relevant remediation implemented or planned.

Previously Implemented Yes	No	NK	Inclusive Dates	Description/COMMENT
				NA

Currently Implemented Yes	No	NK	Start Date	Description/COMMENT
				NA

Planned to be Implemented Yes	No	NK	Start Date	Description/COMMENT
				NA

[1] UNIT ID as coded on your facility site map.

A-3.6.12

3-2 LAND DISPOSAL
LANDFILLS, SURFACE IMPOUNDMENTS AND/OR WASTE PILES

NOTE: COMPLETE 3-2.1 THROUGH 3-2.3 FOR EACH INDIVIDUAL LAND DISPOSAL SWMU WHICH EITHER IS CURRENTLY OR HAS PREVIOUSLY BEEN OPERATED ON YOUR SITE.

3-2.1 WASTE CHARACTERISTICS

Provide the following information regarding the wastes that are/have been stored, treated, or disposed of in the identified land disposal unit. Identify the unit according to your map identifier code and provide the appropriate EPA process code.[2] Indicate the operational status of the unit, identifying the first year of operation for active units or the inclusive dates of operation [from - to] for units presently inactive. Include the hazardous waste code from 40 CFR, Subpart D for each listed hazardous waste handled at each unit. If you handle/handled hazardous wastes which are not cited in 40 CFR, Subpart D, enter the code(s) from 40 CFR, Subpart C that describe(s) the characteristics and/or the toxic constituents of those hazardous wastes.[2] For any wastes which do not have a corresponding EPA hazardous waste number, please determine, as best you can, if the particular waste would be considered a hazardous waste or to contain hazardous waste constituent(s) under RCRA and provide waste descriptions.[2] For each waste, indicate the quantity that was/is handled on an ANNUAL basis. Provide the appropriate unit of measure (e.g., tons, cubic yards, drums or gallons). Please indicate (x) in last column if any prior or current release of hazardous waste or hazardous waste constituents was/is associated with the unit described.

SWMU TYPE/ UNIT IDENTIFIER[1]	SIZE	OPERATIONAL STATUS	EPA PROCESS CODE	EPA HAZARDOUS WASTE NO. OR WASTE DESCRIPTION[2]	ESTIMATED ANNUAL QUANTITY (SPECIFY UNITS)	ASSOCIATED RELEASE?
LD-02 *	156,000 CY	ACTIVE: _____	D80	**		No Evidence of Release
		YEAR START: ____		INCINERATOR ASH		
		INACTIVE X		GLASS		
		INCLUSIVE YEARS: 1966 - 1979		DEBRIS		
				PLANT TRASH (PAPER, WOOD, CARDBOARD, METAL)	12000 CY/YR. COMPACTED VOLUME	
				VITAMINS		
				WASTEWATER TREATMENT SLUDGE		
				FERMENTATION CAKE		
				REACTIVE / EXPLOSIVE CHEMICALS	OCCASIONALLY	

LANDFILL 2

* THIS SITE IS INCLUDED IN NEW YORK'S REGISTRY OF INACTIVE HAZARDOUS WASTE SITES, CLASSIFIED AS "UNKNOWN". THE SITE IS SCHEDULED TO BE STUDIED THIS YEAR

** SINCE THIS IS AN INACTIVE LANDFILL WE ARE PROVIDING A LIST OF MATERIALS TYPICALLY DISPOSED. THE BULK OF THIS MATERIAL IS NOT HAZARDOUS AND IS NOT EXPECTED TO CONTAIN HAZARDOUS CONSTITUENTS.

1 UNIT ID as coded on your facility site map.

2 EPA Process Codes, EPA Hazardous Waste Codes from Subparts C and D and criteria constituting wastes regulated under RCRA are defined in Part 1 DEFINITIONS of this questionnaire.

A-3.1.12

3-2 LAND DISPOSAL

3-2.2 WASTE MANAGEMENT PRACTICES

Please answer the following questions concerning waste management practices associated with the land disposal unit identified on the preceding page.

1. Were/are measures taken to divert run-on from the unit?

Yes	No	NK	COMMENT
X			THE closed LANDFILL #2 (LD-02) IS 12 FEET ABOVE GROUND LEVEL. THERE IS NO RUN-ON ASSOCIATED WITH THIS LANDFILL.

Description of Measures Taken:

2. Are/were bulk or non-containerized liquid wastes or wastes containing free liquid placed in the unit?

Yes	No	NK	COMMENT
	X		SEE ITEM 6

3. Were/are liners used? If yes, specify liner type.

Yes	No	NK	Liner type (e.g., clay or other liner resistant to organic compounds)/COMMENT
	X		

4. Did/does the unit have a functioning leachate collection system? Please describe.

Yes	No	NK	Description/COMMENT
	X		

5. Did/does the unit have containment and drainage control systems (e.g., protective cover)? Please describe.

Yes	No	NK	Description/COMMENT
X			UNIT IS COVERED WITH 2 FEET OF CLAY-LIKE MATERIAL (COMPOST) AND VEGETATION.

6. Are/were liquid wastes treated chemically or physically so that free liquids are/were no longer present? Specify treatment method.

Yes	No	NK	COMMENT
X			OCCASIONALLY LABORATORY CHEMICALS WERE DETONATED/BURNED IN THIS AREA.

[1] UNIT ID as coded on your facility site map.

D-3-88-2

3-2 LAND DISPOSAL

3-2.2 Cont'd

7. Were/are reactive, ignitable, or incompatible wastes placed in the unit? If so, was/is the waste treated, rendered or mixed so that it no longer posed/poses a hazard? Please specify.

Yes	No	NK	If yes, mitigative treatment?	Unknown Treatment	Description/COMMENT
	X				

8. Did/does the unit contain waste that generates methane (eg, biodegradable organics) or volatile constituents?

Yes	No	NK	If Yes, Constituents	COMMENT
X			FOOD WASTES	MINIMAL QUANTITIES

If yes, were/are emission controls in place that would prevent gas migration from the unit? Describe the controls.

Yes	No	NK	Description/COMMENT
	X		

9. If the unit is/was a surface impoundment, are/were procedures in place to maintain at least 2 feet (60 cm) of freeboard?

Yes	No	NA	NK	COMMENT
		X		

If yes, were/are the procedures manual or automatic? Please describe.

Manual	Automatic	Procedure Description/COMMENT
		NA

[1] UNIT ID as coded on your facility site map.

A-3.9.12

3-2 LAND DISPOSAL

3-2.2 Cont'd

Was/is there any evidence of overtopping of the dike?

Yes	No	NK	COMMENT
			NA

10. Were/are groundwater monitoring programs in place to detect contamination due to seepage from this unit?

Yes	No	Seepage Observed? Yes	Seepage Observed? No	Comment
X				GROUNDWATER QUALITY IS MONITORED AT THE PROPERTY LINE (APPROXIMATELY 1000 FT. DOWNGRADIENT).

11. If not addressed above, please describe briefly any other engineered features designed to prevent releases (to groundwater, surface water, air and soil) from this unit.

NA

12. Structural Integrity: If there are/were any indications that releases may have occurred due to the physical condition of the unit, briefly describe the nature of the problem.

NONE

[1] UNIT ID as coded on your facility site map.

4511b

A-3.10.12

3-2 LAND DISPOSAL

3-2.3 EVIDENCE OF RELEASE/REMEDIATION

Please provide the following information on any prior or current release of hazardous waste or hazardous waste constituents associated with the SWMU described in the preceding pages.

Evidence of Release

None	Indirect*	Positive Proof from Direct Observation	Positive Proof from Laboratory Analyses	Comment
X				

*e.g., discoloration of surrounding soil, dead vegetation

Characteristics of Release

EPA Hazardous Waste # or Waste Description [2]	Estimated Quantity or Volume Released (Units)	Date(s) of Release	Nature of Release
NA			

A-3.11.12

1 UNIT ID as coded on your facility site map.

2 EPA Process Codes, EPA Hazardous Waste Codes from Subparts C and D and criteria constituting wastes regulated under RCRA are defined in Part 1 DEFINITIONS of this questionnaire.

3-2 LAND DISPOSAL

3-2.3 (Cont'd)

For the SWMU described above, please provide any analytical data that may be available which would describe the nature and/or extent of environmental contamination that exists/existed as a result of release. Any information on the concentration of hazardous waste or hazardous waste constituents in contaminated soil, groundwater (GW), surface water (SW) or air should be attached. Include any information data (including groundwater monitoring data) submitted to EPA and the State under any other regulatory programs (e.g., Superfund) that concerns prior or continuing releases as described above. If any analytical data are attached for the unit, please indicate below:

GW Monitoring Data Attached	SW Analytical Data Attached	Soil Analytical Data Attached	Air Monitoring Data Attached
			NA

For the prior/current release documented above please describe relevant remediation implemented or planned.

Previously Implemented Yes	Previously Implemented No	NK	Inclusive Dates	Description/COMMENT
				NA

Currently Implemented Yes	Currently Implemented No	NK	Start Date	Description/COMMENT
				NA

Planned to be Implemented Yes	Planned to be Implemented No	NK	Start Date	Description/COMMENT
				NA

A-3-12-12

[1] UNIT ID as coded on your facility site map.

47-15-1 (5/78)

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID WASTE MANAGEMENT
FACILITY INSPECTION

PERMIT # → 0532

A-4.1.4

1 Trans. Type: 1 ☐ Delete 2 ☒ Add 3 ☐ Change

2 Facility No. 4 1 9 5 0 2 | 8 Card 9 Type 1 1

FILE

Facility Name: LEDERLE

Location (Town, etc.): ORANGETOWN

Persons Interviewed & Titles: TOM KIELLY SR. ENV. ENG.

10 Date 15 | 16 Time 21 | 22 Inspector 36 | 37 38 Remarks 72

03 09 79 0230 P.M. R. MANSFIELD T. GRADING IN PROGRESS

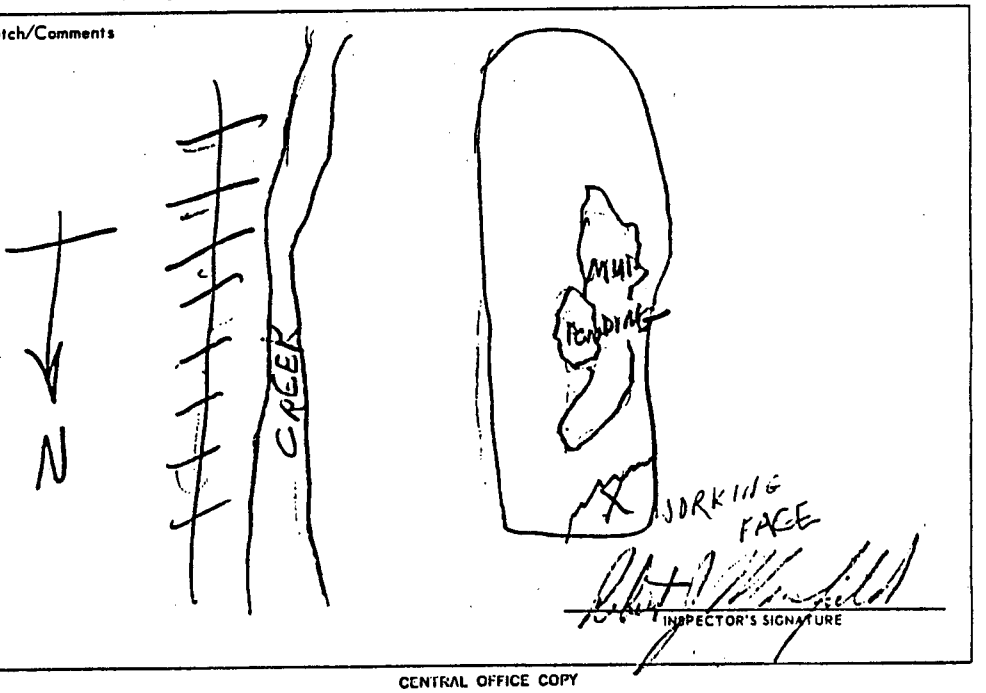
INSTRUCTIONS: At each question, use a soft pencil to blacken either the YES or NO box.

8 CARD 9 TYPE 1 2

		(BAD) YES	(GOOD) NO	
I. LEACHATE				
1. Is leachate visible on, or near the site?	22			22 20
2. Is leachate entering surface water?	23			
*3. Is leachate known to be contravening groundwater standards?	24			
4. Is refuse being placed into water?	25			
II. BURNING				
*5. Is refuse burning without permit, or not under permit conditions?	26			24 11
6. Is there evidence of unapproved previous burning?	27			
III. COVER				
7. Is previous day's refuse not covered?	28			
8. Is refuse protruding through daily, intermediate or final cover?	29			
9. Is intermediate or final cover not in place, or improperly applied?	30			26 15
10. Is wrong cover material used?	31			
IV. GRADING				
11. Are there depressions (ponding), cracked cover, too steep slopes?	32			
12. On completed areas, is the vegetative cover missing or inadequate?	33			28 0
13. Are there soil erosion or other drainage problems?	34			
V. SEPARATION DISTANCES				
14. Is refuse closer than 50 feet to site boundaries?	35			
*15. Is refuse known to be less than 5 feet above groundwater?	36			30 06
*16. Is refuse known to be less than ___ feet above surface water?	37			
VI. NUISANCE CONDITIONS				
17. Are odors detectable off-site?	38			
18. Is blowing dust or dirt excessive or a nuisance?	39			
19. Are papers uncontrolled, or blowing off-site?	40			
20. Is methane gas known to be leaving the site?	41			32 10
21. Is noise excessive off-site?	42			
VII. OPERATION CONTROL				
*22. Are Operation Permit conditions being violated?	43			
23. Is refuse being deposited in a too large area?	44			
24. Is refuse spread in layers thicker than 2 feet?	45			
25. Is refuse being compacted poorly?	46			
26. Is the working face height greater than 10 feet?	47			
27. Is the working face steeper than a 3 to 1 slope?	48			34 18
28. Is the equipment on site not adequate for proper operation?	49			
VIII. SAFETY AND HEALTH				
29. Are scavengers present?	50			
30. Is salvaging uncontrolled or creating a nuisance?	51			
31. Are rodents and insects not controlled?	52			36 07
32. Do unsafe conditions or equipment exist?	53			
IX. ACCESS CONTROL				
33. Is access to the site improperly or inadequately controlled?	54			
34. Is the site open without an attendant?	55			
35. Is information about the site not posted? (hours of operation, etc.)	56			38 07
36. Is access to the operating area poor or unsafe?	57			

*NOTE: For these questions, see the "Background Information Sheet" for this facility.

Site Sketch/Comments



INSPECTOR'S SIGNATURE

CENTRAL OFFICE COPY

47-15-1 (5/78)

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID WASTE MANAGEMENT
FACILITY INSPECTION

4-4-2-4

1 Trans. Type: 1 [ ] Delete; 2 [X] Add; 3 [ ] Change

2 Facility No. 7: 4-4-2-4 | 8 Card 9 Type: 1 | 1

Facility Name: LEDERLE SAN. L.F.

Location (Town, etc.): ORANGETOWN

Persons Interviewed & Titles: TOM REILLEY ENVIRONMENTAL ENG.

Remarks 72: I VEG. COVER TO BE PLACED IN MAY

10 Date 15	16 Time 21	22 Inspector 36	37	38
04.27.79	1300 (A M / P M)	R. MANSFIELD	I	

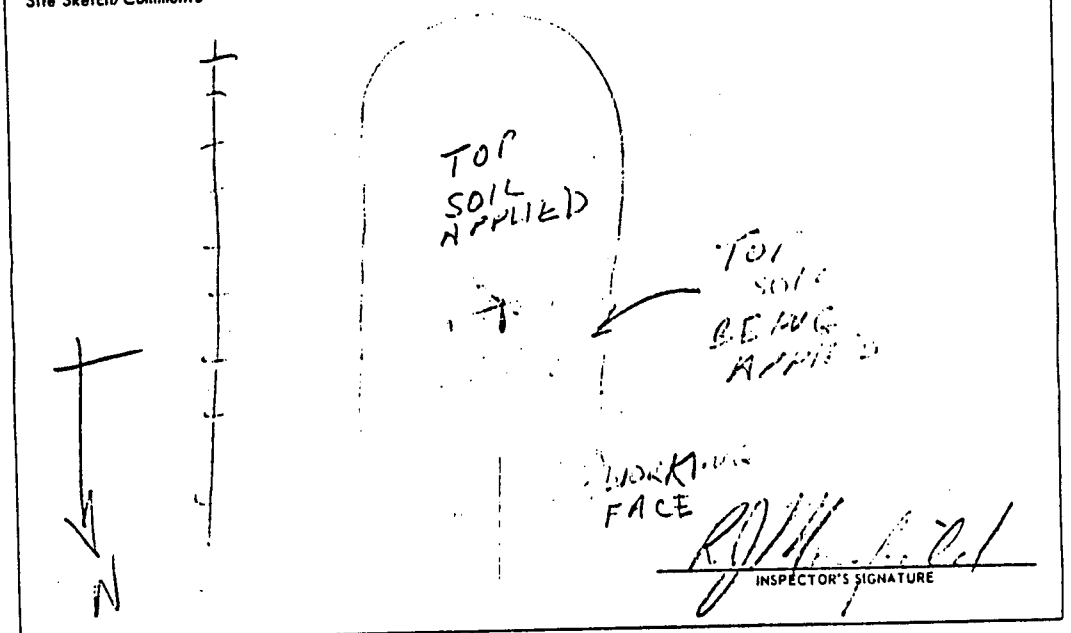
INSTRUCTIONS: At each question, use a soft pencil to blacken either the YES or NO box.

8 CARD 9 TYPE: 1 | 2

		(BAD) YES	(GOOD) NO	
I. LEACHATE				
1. Is leachate visible on, or near the site?	22			22
2. Is leachate entering surface water?	23			
*3. Is leachate known to be contravening groundwater standards?	24			
4. Is refuse being placed into water?	25			
II. BURNING				
*5. Is refuse burning without permit, or not under permit conditions?	26			24
6. Is there evidence of unapproved previous burning?	27			
III. COVER				
7. Is previous day's refuse not covered?	28			
8. Is refuse protruding through daily, intermediate or final cover?	29			
9. Is intermediate or final cover not in place, or improperly applied?	30			26
10. Is wrong cover material used?	31			
IV. GRADING				
11. Are there depressions, ponding, cracked cover, too steep slopes?	32			
12. On completed areas, is the vegetative cover missing or inadequate?	33			28
*13. Are there soil erosion or other drainage problems?	34			
V. SEPARATION DISTANCES				
14. Is refuse closer than 50 feet to site boundaries?	35			
*15. Is refuse known to be less than 5 feet above groundwater?	36			30
*16. Is refuse known to be less than ___ feet above surface water?	37			
VI. NUISANCE CONDITIONS				
17. Are odors detectable off-site?	38			
18. Is blowing dust or dirt excessive or a nuisance?	39			
19. Are papers uncontrolled, or blowing off-site?	40			32
20. Is methane gas known to be leaving the site?	41			
21. Is noise excessive off-site?	42			
VII. OPERATION CONTROL				
*22. Are Operation Permit conditions being violated?	43			
23. Is refuse being deposited in a too large area?	44			
24. Is refuse spread in layers thicker than 2 feet?	45			
25. Is refuse being compacted poorly?	46			
26. Is the working face height greater than 10 feet?	47			
27. Is the working face steeper than a 3 to 1 slope?	48			34
28. Is the equipment on site not adequate for proper operation?	49			
VIII. SAFETY AND HEALTH				
29. Are scavengers present?	50			
30. Is salvaging uncontrolled or creating a nuisance?	51			
31. Are rodents and insects not controlled?	52			36
32. Do unsafe conditions or equipment exist?	53			
IX. ACCESS CONTROL				
33. Is access to the site improperly or inadequately controlled?	54			
34. Is the site open without an attendant?	55			
35. Is information about the site not posted? (hours of operation, etc.)	56			38
36. Is access to the operating area poor or unsafe?	57			

*NOTE: For these questions, see the "Background Information Sheet" for this facility.

Site Sketch/Comments



INSPECTOR'S SIGNATURE

CENTRAL OFFICE COPY

A-4-3-4

47-15-1(5/78)

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID WASTE MANAGEMENT
FACILITY INSPECTION

1 Trans. Type: 1 [ ] Delete, 2 [X] Add, 3 [ ] Change

2 Facility No. 7: 4-1-5102 | 8 Card 9 Type: 1 | 1

Facility Name: LEDELE LF

Location (Town, etc.): ORANGETOWN

Persons Interviewed & Titles: GEORGE KELLY ENG. AIDE.

10 Date 15 | 16 Time 21 | 22 Inspector 36 | 37 | 38 Remarks 72

09/10/79 | 1020 AM | K MARSFIELD | WORKING ON SLOPE TO CORRECT #37

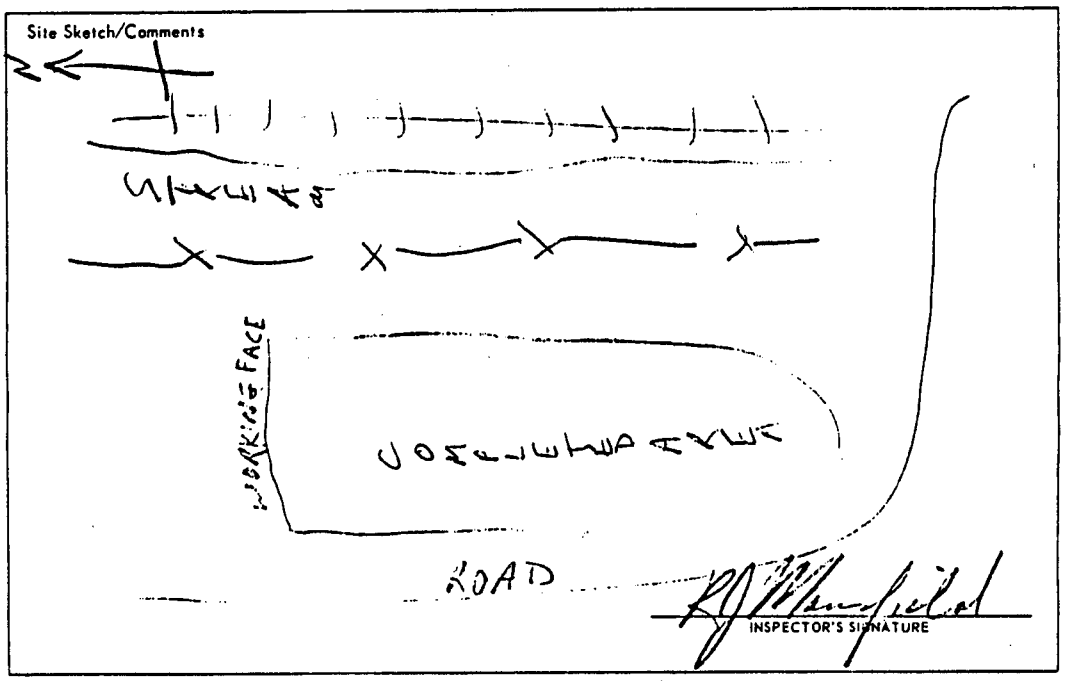
INSTRUCTIONS: At each question, use a soft pencil to blacken either the YES or NO box.

8 CARD 9 TYPE: 1 | 2

		(BAD) YES	(GOOD) NO	
I. LEACHATE				
1. Is leachate visible on, or near the site?	22			27
2. Is leachate entering surface water?	23			20
*3. Is leachate known to be contravening groundwater standards?	24			
4. Is refuse being placed into water?	25			
II. BURNING				
*5. Is refuse burning without permit, or not under permit conditions?	26			24
6. Is there evidence of unapproved previous burning?	27			11
III. COVER				
7. Is previous day's refuse not covered?	28			
8. Is refuse protruding through daily, intermediate or final cover?	29			
9. Is intermediate or final cover not in place, or improperly applied?	30			26
10. Is wrong cover material used?	31			15
IV. GRADING				
11. Are there depressions, ponding, cracked cover, too steep slopes?	32			
12. On completed areas, is the vegetative cover missing or inadequate?	33			28
13. Are there soil erosion or other drainage problems?	34			66
V. SEPARATION DISTANCES				
14. Is refuse closer than 50 feet to site boundaries?	35			
*15. Is refuse known to be less than 5 feet above groundwater?	36			30
*16. Is refuse known to be less than 10? feet above surface water? FLOW	37			06
VI. NUISANCE CONDITIONS				
17. Are odors detectable off-site?	38			
18. Is blowing dust or dirt excessive or a nuisance?	39			
19. Are papers uncontrolled, or blowing off-site?	40			
20. Is methane gas known to be leaving the site?	41			32
21. Is noise excessive off-site?	42			10
VII. OPERATION CONTROL				
*22. Are Operation Permit conditions being violated?	43			
23. Is refuse being deposited in a too large area?	44			
24. Is refuse spread in layers thicker than 2 feet?	45			
25. Is refuse being compacted poorly?	46			
26. Is the working face height greater than 10 feet?	47			
27. Is the working face steeper than a 3 to 1 slope?	48			34
28. Is the equipment on site not adequate for proper operation?	49			16
VIII. SAFETY AND HEALTH				
29. Are scavengers present?	50			
30. Is salvaging uncontrolled or creating a nuisance?	51			
31. Are rodents and insects not controlled?	52			36
32. Do unsafe conditions or equipment exist?	53			07
IX. ACCESS CONTROL				
33. Is access to the site improperly or inadequately controlled?	54			
34. Is the site open without an attendant?	55			
35. Is information about the site not posted? (hours of operation, etc.)	56			38
36. Is access to the operating area poor or unsafe?	57			07

*NOTE: For these questions, see the "Background Information Sheet" for this facility.

Site Sketch/Comments



INSPECTOR'S SIGNATURE

CENTRAL OFFICE COPY

A-4-4-4

47-15-1 (5/78)

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID WASTE MANAGEMENT
FACILITY INSPECTION

1 Trans. Type: 1 [ ] Delete, 2 [X] Add, 3 [ ] Change

2 Facility No. 7: 4-4-S-0-12 | 8 Card 9 Type: 1 | 1

Facility Name: SMU LEDGE LAKES - LANDFILL

Location (Town, etc.): PEARL RIVER, N.Y.

Persons Interviewed & Titles: MR. THOMAS REILLY - ENVIRONMENTAL ENGINEER

10 Date 15	16 Time 21	22 Inspector 36	37	38 Remarks 72
030780	1.00 PM	PARNELL	T	

INSTRUCTIONS: At each question, use a soft pencil to blacken either the YES or NO box.

8 CARD 9 TYPE: 1 | 2

		(BAD) YES	(GOOD) NO	
I. LEACHATE				
1. Is leachate visible on, or near the site?	22			
2. Is leachate entering surface water?	23			
*3. Is leachate known to be contravening groundwater standards?	24			
4. Is refuse being placed into water?	25			22: 20
II. BURNING				
*5. Is refuse burning without permit, or not under permit conditions?	26			
6. Is there evidence of unapproved previous burning?	27			24: 11
III. COVER				
7. Is previous day's refuse not covered?	28			
8. Is refuse protruding through daily, intermediate or final cover?	29			
9. Is intermediate or final cover not in place, or improperly applied?	30			
10. Is wrong cover material used?	31			26: 15
IV. GRADING				
11. Are there depressions, ponding, cracked cover, too steep slopes?	32			
12. On completed areas, is the vegetative cover missing or inadequate?	33			
13. Are there soil erosion or other drainage problems?	34			28: 06
V. SEPARATION DISTANCES				
14. Is refuse closer than 50 feet to site boundaries?	35			
*15. Is refuse known to be less than 5 feet above groundwater?	36			
*16. Is refuse known to be less than ___ feet above surface water?	37			30: 06
VI. NUISANCE CONDITIONS				
17. Are odors detectable off-site?	38			
18. Is blowing dust or dirt excessive or a nuisance?	39			
19. Are papers uncontrolled, or blowing off-site?	40			
20. Is methane gas known to be leaving the site?	41			
21. Is noise excessive off-site?	42			32: 10
VII. OPERATION CONTROL				
*22. Are Operation Permit conditions being violated?	43			
23. Is refuse being deposited in a too large area?	44			
24. Is refuse spread in layers thicker than 2 feet?	45			
25. Is refuse being compacted poorly?	46			
26. Is the working face height greater than 10 feet?	47			
27. Is the working face steeper than a 3 to 1 slope?	48			
28. Is the equipment on site not adequate for proper operation?	49			34: 18
VIII. SAFETY AND HEALTH				
29. Are scavengers present?	50			
30. Is salvaging uncontrolled or creating a nuisance?	51			
31. Are rodents and insects not controlled?	52			
32. Do unsafe conditions or equipment exist?	53			36: 02
IX. ACCESS CONTROL				
33. Is access to the site improperly or inadequately controlled?	54			
34. Is the site open without an attendant?	55			
35. Is information about the site not posted? (hours of operation, etc.)	56			
36. Is access to the operating area poor or unsafe?	57			38: 01

*NOTE: For these questions, see the "Background Information Sheet" for this facility.

Site Sketch/Comments

Side cap slopes are greater than 3(horiz) to 1(vert.), but this is a temporary condition.

INSPECTOR'S SIGNATURE

CENTRAL OFFICE COPY

CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS
OF THE
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE
WASHINGTON, D.C. 20515

A-5-1-5

April 18, 1979

The Subcommittee on Oversight and Investigations, under Rules X and XI of the House of Representatives, is conducting an investigation into problems associated with the disposal of industrial waste materials. The Subcommittee's inquiry will include an examination of the performance of the Environmental Protection Agency, in implementing the Resource Conservation and Recovery Act of 1976, and a determination of whether additional legislation is needed to address these problems.

The Subcommittee's investigation has disclosed that some disposal practices of the past, which appear to be questionable in the light of present day knowledge, have raised increasing concerns among certain sectors of the public, industry and government. The potential for adverse health and environmental effects from these practices are most acute where dump sites are abandoned or inactive, and their locations are unknown to responsible authorities.

In an attempt to begin to identify such sites, the Subcommittee is requesting each of the 50 largest domestic chemical companies to contact all of their plants or facilities, and those of their subsidiaries and affiliates, to gather data on dump sites and on industrial waste disposal practices since 1950, and to report such data on the enclosed questionnaire forms. This effort is not to suggest that the chemical industry is solely responsible for the situation that exists, but the very nature of your industry is such that large quantities of potentially dangerous wastes are generated. Additionally, this is only the first step of an effort to conduct a comprehensive national survey.

I recognize that going back thirty years in company records will be a difficult and, in some instances, impossible task, merely because complete records may not exist. But where there are no records, I hope you will attempt, as thoroughly as possible, through interviews of long-time employees, to pinpoint former dump sites.

A-525

Moreover, I would ask that you not necessarily limit your search to the period since 1950. The chemical industry was a vital part of our war effort and it is conceivable, even understandable, that during that time of national emergency dumping of dangerous waste materials occurred in a manner most expeditious for the moment.

Our objective is not to assess blame or give undue publicity regarding the disposal practices of this industry or any of its component companies; rather we are soliciting your cooperation and assistance in obtaining as complete information as possible in a narrowly defined area. While our primary focus is on identifying abandoned and inactive sites, which may or may not be dangerous, we are requesting information about the overall disposal practices of each of the surveyed companies to better understand and deal with the problem.

The questionnaire has been designed to achieve the objective of the survey and yet minimize the burden on your company and avoid proprietary information as much as possible. With respect to the data you provide, you may be assured that the Subcommittee and its staff will treat the data with the same high degree of care and control accorded all investigative materials containing sensitive data. Unauthorized disclosures will not be made. At the same time, you should be aware that the Subcommittee may always authorize disclosure of information it deems to be in the public interest, consistent with our valid legislative purpose, and which is relevant to our investigation.

The survey forms (Forms A, B, C, and D), together with instructions, are enclosed. In addition, the Subcommittee staff will be available to respond to any questions you may have with regard to the questionnaire at a private briefing for the participating companies on Friday, April 27, 1979, at 3:00 p.m. in Room 2123 Rayburn House Office Building. It would be appreciated if you would withhold your questions until that time.

A copy of this letter, with enclosures, has been sent to your Washington representative. Sufficient quantities of the questionnaires for your company will be available following the staff briefing.

It is requested that the completed questionnaires be returned to the Subcommittee office by the close of business, Friday, June 29, 1979.

Your cooperation in this effort is greatly appreciated.

Sincerely,

Bob Eckhardt

Bob Eckhardt
Chairman
Subcommittee on
Oversight and Investigations

(DO NOT USE) (1-5) A-5-3-5

FORM A: GENERAL FACILITY INFORMATION

Company Name: American Cyanamid Company
Division/~~Subsidiary~~: Lederle Laboratories Division
Facility Name: Pearl River Plant

Address: Middletown Road
No. Street

Pearl River | New York | 10965
City | State | Zip Code

Name of Person Completing Form: Robert G. Brewster

Position: Plant Manager

Phone Number: (914) 735-5000

1. Year Facility Opened ..... 19 [47] (10-11)

2. Primary SIC Code ..... [2834] (12-15)

3. Estimate the total amounts of process wastes (excluding wastes sold for use) generated by this facility during 1978:

   thousand gallons ..... [ ] (16-24)

   hundred tons ..... [376] (25-32)

   thousand cubic yards ..... [ ] (33-41)

4. Estimate (in whole percents) how these process wastes generated in 1978 were disposed of:

   in landfill ..... [62] (42-44)

   in pit/pond/lagoon ..... [ ] (45-47)

   in deep well ..... [ ] (48-50)

   incinerated ..... [7] (51-53)

   reprocessed/recycled ..... [ ] (54-56)

   evaporated ..... [ ] (57-59)

   unknown ..... [ ] (60-62)

   other (Specify Fuel, Cement & Chemical Recovery) ..... [31] (63-65)

5. What is the total number of known sites (including disposal on the property where this facility is located as one site) that have been used for the disposal of process wastes from this facility since 1950? ..... [1] (66-68)

   COMPLETE ONE FORM "B" FOR EACH OF THE SITES

6. Have any of the process wastes generated at this facility been hauled (removed) from this facility for disposal? (Yes=1; no=2) ..... [1] (69)

   IF YES, COMPLETE FORM "C"

7. Do you know the disposal site locations of all of the process waste hauled from your facility since 1950? (Yes=1; no=2) ..... [2] (70)

   IF NO, COMPLETE ONE FORM "D" FOR EACH FIRM OR CONTRACTOR WHO TOOK WASTE TO AN UNKNOWN LOCATION

8. Specify the earliest year represented by information from company or facility records supplied on this and other forms ..... 19[46] (71-72)

9. Specify the earliest year represented by information from employee knowledge supplied on this and other forms ..... 19[36]

~~CONFIDENTIAL~~

A-545

(1-8) (DO NOT USE)

FORM B: DISPOSAL SITE INFORMATION

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: American Cyanamid Company Division/~~Subsidiary~~: Lederle Laboratories
Facility Name: Pearl River Plant
Name of Site: Sanitary Landfill Area
Address of Site: Middletown Road
no. street
Pearl River N. Y. 10965
city state zip code

Name of Owner (while used by facility): American Cyanamid Company
Address: 859 Berdan Ave.
no. street
Wayne N.J. 07470
city state zip code

Current Owner (if different from above): _____
Address: _____
no. street
city state zip code

1. Location (1= the property on which facility is located; 2= off-site) 1 (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) 1 (11)
3. Current status (1= closed; 2= still in use; 9=don't know) 2 (12)
   IF CLOSED, specify year closed ..... 19 [ ] (13-14)
4. Year first used for process waste from this facility 19 50 (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) 19 79 (17-18)
6. Total amount of process waste from this facility disposed at site:
   thousand gallons ..... [ ] (19-24)
   hundred tons 1 2 7 7 8 (19-24)
   thousand cubic yards ..... [ ] (19-24)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
   landfill, mono industrial waste 3 (42)
   landfill, mixed industrial waste 1 (43)
   landfill, drummed waste 2 (44)
   landfill, municipal refuse co-disposed ... 3 (45)
   pits/ponds/lagoons 2 (46)
   deep well injection 3 (47)
   land farming 3 (48)
   incineration 2 (49)
   treatment (eg. neutralizing)..... 1 (50)
   reprocessing/recycling 3 (51)
   other (specify) _____ .... [ ] (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) 1

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

FORM B CONTINUED ON SECOND PAGE

[ ] (80)

FORM B - Page 2

(1-8) (DO NOT USE) A-555

Company Name: American Cyanamid Company
Division/Subsidiary: Lederle Laboratories
Facility Name: Pearl River Plant

Site Name: Sanitary Landfill Area

9. Components (or characteristics) of process waste from this facility disposed at site: (1=present in waste; 2=not present in waste; 9=don't know)

FILL IN EVERY BLOCK SPACE

Acid solutions, with pH<3	2	(10)
pickling liquor	2	(11)
metal plating waste	2	(12)
circuit etchings	2	(13)
inorganic acid manufacture	2	(14)
organic acid manufacture	2	(15)
Base solutions, with pH>10	2	(16)
caustic soda manufacture	2	(17)
nylon and similar polymer generation	2	(18)
scrubber residual	2	(19)
Heavy metals & trace metals (bonded organically & inorganically)	1	(2[illegible]
arsenic, selenium, antimony	1	
mercury	1	
iron, manganese, magnesium	1	[illegible]
zinc, cadmium, copper, chromium (trivalent)	1	(24)
chromium (hexavalent)	2	(25)
lead	1	(26)
Radioactive residues, >3 pico curies/liter	2	(27)
uranium residuals & residuals for UF_6 recycling	2	(28)
lathanide series elements and rare earth salts	2	(29)
phosphate slag	2	(30)
thorium	2	(31)
radium	2	(32)
other alpha, beta & gamma emitters	2	(33)
Organics	1	(34)
pesticides & intermediates	2	(35)
herbicides & intermediates	2	(36)
fungicides & intermediates	2	(37)
rodenticides & intermediates	2	(38)
halogenated aliphatics	2	(39)
halogenated aromatics	2	(40)
acrylates & latex emulsions	2	(41)
PCB/PBB's	2	(42)
amides, amines, imides	2	(43)
plastizers	2	(44)
resins	2	(45)
elastomers	2	(46)
solvents polar (except water)	2	(47)
carbontetrachloride	2	(48)
trichloroethylene	2	(49)
other solvents nonpolar	1	(50)
solvents halogenated aliphatic	2	(5[illegible]
solvents halogenated aromatic	2	
oils and oil sludges	1	
esters and ethers	9	
alcohols	1	
ketones & aldehydes	2	(56)
dioxins	2	(57)
Inorganics	1	(58)
salts	1	(59)
mercaptans	2	(60)
Misc.	1	(61)
pharmaceutical wastes	1	(62)
paints & pigments	1	(63)
catalysts (eg. vanadium, platinum, palladium)	2	(64)
asbestos	1	(65)
shock sensitive wastes (eg. nitrated toluenes)	2	(66)
air water reactive wastes (eg. P_4, aluminum chloride)	2	(67)
wastes with flash point below 100° F	2	(68)

7

2 (70)

A-6-1-53

LEDERLE LABORATORIES

A Division of AMERICAN CYANAMID COMPANY

PEARL RIVER, NEW YORK 10965

AREA CODE 914 735-5000

October 2, 1985

Mr. John T. Parnell, P.E.
Solid Waste Engineer
Rockland County Department
of Health
Pomona, NY 10970

RE: Lederle Laboratories
Completed Sanitary
Landfills No. 1 and 2

Dear Mr. Parnell,

Pursuant to your visit to the Lederle Plant on Wednesday, September 18, 1985, enclosed are priority pollutant analysis results of the groundwater and surface water at the point where the waters leave the property. A sketch indicating the relative depths of these wells is also enclosed. Lederle drawing previously furnished Number G-28555C "Test Borings Landfill Area" indicates the location of the monitoring wells.

The attached data verifies that these waters are considered acceptable for potable water uses in accordance with New York State guidelines.

If you have further concerns, please contact this office.

Very truly yours,

Thomas J. Reilly, P.E.
Environmental Technology

TJR:cit
Enclosures

RADIAN
CORPORATION

PAGE 1 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: ~~06/28/85~~ 07/17/85 17:01:07

REPORT TO: American Cyanamid
Lederle Laboratories Division
Building 141, Middletown Road
Pearl River, New York 10965
ATTEN: Mr. Don Reihardt

PREPARED BY: Radian Analytical Services
8501 MoPac Blvd.
P.O. Box 9948
Austin, Texas 78766
ATTEN:
PHONE: (512) 454-4797

Lucas A. Petrovan
CERTIFIED BY

CONTACT RICHARDSON

CLIENT: AMER CYAN NY SAMPLES 7
COMPANY: American Cyanamid
FACILITY: Lederle Laboratories Division

WORK ID: priority pollutants
TAKEN:
TRANS: Fed Ex
TYPE: Water Samples
P.O. #: PR 50666/50752
INVOICE: under separate cover

Footnotes and Comments

* Indicates a value less than 5 times the detection limit. Potential error for such low values ranges between 50 and 100%.

@ Indicates that spike recovery for this analysis on the specific matrix was not within acceptable limits indicating an interferent present.

SAMPLE IDENTIFICATION

01	PB	PEARL BROOK
02	CB	CHERRY BROOK
03	81-1	GROUND WATER *
04	81-A	GROUND WATER *
05	81-C	GROUND WATER *
06	CW	CITY WATER
07	WW	WELL WATER

* MONITORING WELLS

Analytical Serv TEST CODES and NAMES used on this report

CNTOTA	Total Cyanide
C MET	Priority Pollutant Metals
EX 625	Extraction only - 625 BN/A
M625 A	Method 625 Acid Compounds
M625 B	Method 625 Base/Neutrals
MS 624	EPA Method 624/GC-MS
PHEN A	Total Phenolics

A-6-2-53

RECEIVED
AUG 1 1985
T. J. REILLY

RADIAN CORPORATION

PAGE 2
RECEIVED: 06/28/85

Analytical Serv REPORT
RESULTS BY TEST

LAB # 85-06-208

TEST CODE default units	Sample 01 (entered units)	Sample 02 (entered units)	Sample 03 (entered units)	Sample 04 (entered units)	Sample 05 (entered units)
CNTOTA mg/L	< .01	< .01	< .01	< .01	< .01
EX_625 date complete	07/02/85	07/02/85	07/02/85	07/02/85	07/02/85
PHEN_A mg/L	0.028 PB	0.051 CB ?	0.034 81-1	0.023 21-A	< .005

TEST CODE default units	Sample 06 (entered units)	Sample 07 (entered units)
CNTOTA mg/L	< .01	< .01
EX_625 date complete	07/02/85	07/02/85
PHEN_A mg/L	< .005 CW	< .005 MW

A-6.2.53

RADIAN CORPORATION

PAGE 3 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID PB SAMPLE # 01 FRACTIONS: A,B,C,D,E,F
Date & Time Collected not specified Category

CNTOTA <.01 mg/L EX 625 07/02/85 (date complete) PHEN A 0.028 mg/L

A-6-4-53

RADIAN CORPORATION

PAGE 4 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID PB FRACTION O1C TEST CODE C MET NAME Priority Pollutant Metals
Date & Time Collected not specified Category

DATE ANALYZED 07/09/85 VERIFIED BY GMC

Analyzed by ICPES

CODE	METAL	RESULT
AG	Silver	<.002
BE	Beryllium	<.001
CD	Cadmium	<.002
CR	Chromium	0.006*
CU	Copper	0.005*
NI	Nickel	<.003
ZN	Zinc	0.009*

Analyzed by AA

CODE	METAL	RESULT
AS	Arsenic	<.002
HG	Mercury	0.0008*
PB	Lead	<.001
SE	Selenium	<.002
SB	Antimony	<.002
TL	Thallium	<.003

NOTES AND DEFINITIONS FOR THIS REPORT

All results reported in ug/ml unless otherwise specified.
NA = not analyzed
* = less that 5 times the detection limit.

A-6.5.53

RADIAN CORPORATION

PAGE 5 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID PB FRACTION O1D TEST CODE M625 A NAME Method 625 Acid Compounds
Date & Time Collected not specified Category

DATA FILE 2CU06208C01 DATE EXTRACTED 07/02/85 ANALYST WJL VERIFIED BY LAK
CONC. FACTOR 1 DATE INJECTED 07/12/85 INSTRUMENT COMPOUNDS DETECTED 0

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
11A		21A	2,4,6-trichlorophenol	ND	7A		58A	4-nitrophenol	ND
8A		22A	4-chloro-3-methylphenol	ND	5A		59A	2,4-dinitrophenol	ND
1A		24A	2-chlorophenol	ND	4A		60A	2-methyl-4,6-dinitrophenol	ND
2A		31A	2,4-dichlorophenol	ND	9A		64A	pentachlorophenol	ND
3A		34A	2,4-dimethylphenol	ND	10A		65A	phenol	ND
6A		57A	2-nitrophenol	ND					

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

A-16.6.53

KADIAN CORPORATION

PAGE 6 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID PB FRACTION 01D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

DATA FILE 2CU06208C01 DATE EXTRACTED 07/02/85 ANALYST WJL VERIFIED BY LAK
CONC. FACTOR 1 DATE INJECTED 07/12/85 INSTRUMENT COMPOUNDS DETECTED 2

NPDES	SCAN	EPA	COMPOUND	RESULT
1B		1B	acenaphthene	ND
4B		5B	benzidine	ND
46B		8B	1,2,4-trichlorobenzene	ND
33B		9B	hexachlorobenzene	ND
36B		12B	hexachloroethane	ND
11B		18B	bis(2-chloroethyl)ether	ND
16B		20B	2-chloronaphthalene	ND
20B		25B	1,2-dichlorobenzene	ND
21B		26B	1,3-dichlorobenzene	ND
22B		27B	1,4-dichlorobenzene	ND
23B		28B	3,3'dichlorobenzidine	ND
27B		35B	2,4-dinitrotoluene	ND
28B		36B	2,6-dinitrotoluene	ND
29B		37B	1,2-diphenylhydrazine	ND
31B		39B	fluoranthene	ND
17B		40B	4-chlorophenyl phenyl ether	ND
41B		61B	N-nitrosodimethylamine	ND
43B		62B	N-nitrosodiphenylamine	ND
42B		63B	N-nitrosodi-n-propylamine	ND
13B	1608	66B	bis(2-ethylhexyl)phthalate	10
15B		67B	butyl benzyl phthalate	ND
26B	1263	68B	di-butyl phthalate	3
29B		69B	di-n-octyl phthalate	ND
24B		70B	diethyl phthalate	ND
25B		71B	dimethyl phthalate	ND
5B		72B	benzo(a)anthracene A	ND
6B		73B	benzo(a)pyrene	ND
7B		74B	benzo(b)fluoranthene *	ND
9B		75B	benzo(k)fluoranthene *	ND
18B		76B	chrysene A	ND
2B		77B	acenaphthylene	ND
3B		78B	anthracene B	ND

A-6-1.53

SAMPLE ID PB

FRACTION 01D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

14B	41B	4-bromophenyl phenyl ether	ND	8B	79B	benzo(ghi)perylene	ND
12B	42B	bis(2-chloroisopropyl)ether	ND	32B	80B	fluorene	ND
10B	43B	bis(2-chloroethoxy)methane	ND	44B	81B	phenanthrene B	ND
34B	52B	hexachlorobutadiene	ND	19B	82B	dibenzo(a,h)anthracene	ND
35B	53B	hexachlorocyclopentadiene	ND	37B	83B	indeno(1,2,3-cd)pyrene	ND
38B	54B	isophorone	ND	45B	84B	pyrene	ND
39B	55B	naphthalene	ND				
40B	56B	nitrobenzene	ND				

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ug/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

* = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

B = anthracene and phenanthrene co-elute in high concentrations.

A-6.8.53

RADIAN CORPORATION

RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208

SAMPLE ID PB FRACTION 01E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

DATA FILE 4CU06208V01 DATE INJECTED 07/09/85 ANALYST MM VERIFIED BY LAK
CONC. FACTOR 1 INSTRUMENT F4 COMPOUNDS DETECTED 0

NPDES	SCAN	EPA	COMPOUND	RESULT
1V		2V	acrolein	ND
2V		3V	acrylonitrile	ND
3V		4V	benzene	ND
6V		6V	carbon tetrachloride	ND
7V		7V	chlorobenzene	ND
15V		10V	1,2-dichloroethane	ND
27V		11V	1,1,1-trichloroethane	ND
14V		13V	1,1-dichloroethane	ND
28V		14V	1,1,2-trichloroethane	ND
23V		15V	1,1,2,2-tetrachloroethane	ND
9V		16V	chloroethane	ND
4V		17V	bis (chloromethyl) ether	ND
10V		19V	2-chloroethylvinyl ether	ND
11V		23V	chloroform	ND
16V		29V	1,1-dichloroethylene	ND
26V		30V	1,2-trans-dichloroethylene	ND
17V		32V	1,2-dichloropropane	ND
18V		33V	cis-1,3-dichloropropylene	ND
18V		33V	trans-1,3-dichloropropylene	ND
19V		38V	ethylbenzene	ND
22V		44V	methylene chloride	ND
21V		45V	methyl chloride	ND
20V		46V	methyl bromide	ND
5V		47V	bromoform	ND
12V		48V	dichlorobromomethane	ND
30V		49V	trichlorofluoromethane	ND
13V		50V	dichlorodifluoromethane	ND
8V		51V	chlorodibromomethane	ND
24V		85V	tetrachloroethylene	ND
25V		86V	toluene	ND
29V		87V	trichloroethylene	ND
31V		88V	vinyl chloride	ND

A-6-9-53

RADIAN
CORPORATION

RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208
Continued From Above

SAMPLE ID PB

FRACTION 01E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 624, (Federal Register, 12/3/79).

A-6-10-53

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208

SAMPLE ID CB SAMPLE # 02 FRACTIONS: A, B, C, D, E, F
Date & Time Collected not specified Category

CNTOTA <.01 mg/L EX_625 07/02/85 (date complete) PHEN_A 0.051 mg/L

A-6-11-53

RADIAN CORPORATION

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Analytical Serv REPORT
Results by Sample

LAB # 85-06-208

SAMPLE ID CB

FRACTION 02C TEST CODE C MET NAME Priority Pollutant Metals
Date & Time Collected not specified Category

DATE ANALYZED 07/09/85

VERIFIED BY GMC

Analyzed by ICPES

CODE	METAL	RESULT
AG	Silver	<.002
BE	Beryllium	<.001
CD	Cadmium	<.002
CR	Chromium	0.007*
CU	Copper	0.004*
NI	Nickel	<.003
ZN	Zinc	0.005*

Analyzed by AA

CODE	METAL	RESULT
AS	Arsenic	<.002
HG	Mercury	0.0008*
PB	Lead	<.001
SE	Selenium	<.002
SB	Antimony	<.002
TL	Thallium	<.003

NOTES AND DEFINITIONS FOR THIS REPORT

All results reported in ug/ml unless otherwise specified.
NA = not analyzed
* = less that 5 times the detection limit.

A-6-12-53

RADIAN CORPORATION

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Analytical Serv REPORT
Results by Sample

LAB # 85-06-208

SAMPLE ID CB

FRACTION 02D TEST CODE M625 A NAME Method 625 Acid Compounds
Date & Time Collected not specified Category

DATA FILE 2CU06208C02
CONC. FACTOR 1

DATE EXTRACTED 07/02/85
DATE INJECTED 07/12/85

ANALYST WJL
INSTRUMENT

VERIFIED BY LAK
COMPOUNDS DETECTED 0

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
11A		21A	2,4,6-trichlorophenol	ND	7A		58A	4-nitrophenol	ND
8A		22A	4-chloro-3-methylphenol	ND	5A		59A	2,4-dinitrophenol	ND
1A		24A	2-chlorophenol	ND	4A		60A	2-methyl-4,6-dinitrophenol	ND
2A		31A	2,4-dichlorophenol	ND	9A		64A	pentachlorophenol	ND
3A		34A	2,4-dimethylphenol	ND	10A		65A	phenol	ND
6A		57A	2-nitrophenol	ND					

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

A-6-13,53

RADIAN CORPORATION

Analytical Serv REPORT LAB # 85-06-208

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RECEIVED: 06/28/85

Results by Sample

SAMPLE ID CB

FRACTION 02D TEST CODE M625 B NAME Method 625 Base/Neutrals Category

Date & Time Collected not specified

DATA FILE 2CU06208C02
CONC. FACTOR 1

DATE EXTRACTED 07/02/85
DATE INJECTED 07/12/85

ANALYST WJL
INSTRUMENT

VERIFIED BY LAK
COMPOUNDS DETECTED 2

NPDES	SCAN	EPA	COMPOUND	RESULT
1B		1B	acenaphthene	ND
4B		5B	benzidine	ND
46B		8B	1,2,4-trichlorobenzene	ND
33B		9B	hexachlorobenzene	ND
36B		12B	hexachloroethane	ND
11B		18B	bis(2-chloroethyl)ether	ND
16B		20B	2-chloronaphthalene	ND
20B		25B	1,2-dichlorobenzene	ND
[illegible]		[illegible]	[illegible]	ND
[illegible]		[illegible]	[illegible]	ND
[illegible]		28B	3,3'dichlorobenzidine	ND
27B		35B	2,4-dinitrotoluene	ND
28B		36B	2,6-dinitrotoluene	ND
29B		37B	1,2-diphenylhydrazine	ND
41B		61B	N-nitrosodimethylamine	ND
43B		62B	N-nitrosodiphenylamine	ND
42B		63B	N-nitrosodi-n-propylamine	ND
13B	1609	66B	bis(2-ethylhexyl)phthalate	29
15B		67B	butyl benzyl phthalate	ND
26B	1265	68B	di-butyl phthalate	3
29B		69B	di-n-octyl phthalate	ND
24B		70B	diethyl phthalate	ND
25B		71B	dimethyl phthalate	ND
5B		72B	benzo(a)anthracene A	ND
6B		73B	benzo(a)pyrene	ND
7B		74B	benzo(b)fluoranthene *	N
9B		75B	benzo(k)fluoranthene *	N
18B		76B		

A-6.14.53

RADIAN CORPORATION

RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208
Continued From Above

SAMPLE ID CB

FRACTION 02D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

14B	41B	4-bromophenyl phenyl ether	ND	8B	79B	benzo(ghi)perylene	ND
12B	42B	bis(2-chloroisopropyl)ether	ND	32B	80B	fluorene	ND
10B	43B	bis(2-chloroethoxy)methane	ND	44B	81B	phenanthrene B	ND
34B	52B	hexachlorobutadiene	ND	19B	82B	dibenzo(a,h)anthracene	ND
35B	53B	hexachlorocyclopentadiene	ND	37B	83B	indeno(1,2,3-cd)pyrene	ND
38B	54B	isophorone	ND	45B	84B	pyrene	ND
39B	55B	naphthalene	ND				
40B	56B	nitrobenzene	ND				

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ug/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

* = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

B = anthracene and phenanthrene co-elute in high concentrations.

A-6-15-53

RADIAN CORPORATION

PAGE 15 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID CB FRACTION 02E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

DATA FILE 4CU06208V02 DATE INJECTED 07/09/85 ANALYST SF VERIFIED BY LAK
CONC. FACTOR 1 INSTRUMENT F4 COMPOUNDS DETECTED 0

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
1V		2V	acrolein	ND	17V		32V	1,2-dichloropropane	ND
2V		3V	acrylonitrile	ND	18V		33V	cis-1,3-dichloropropylene	ND
3V		4V	benzene	ND	18V		33V	trans-1,3-dichloropropylene	ND
6V		6V	carbon tetrachloride	ND	19V		38V	ethylbenzene	ND
7V		7V	chlorobenzene	ND	22V		44V	methylene chloride	ND
15V		10V	1,2-dichloroethane	ND	21V		45V	methyl chloride	ND
27V		11V	1,1,1-trichloroethane	ND	20V		46V	methyl bromide	ND
14V		13V	1,1-dichloroethane	ND	5V		47V	bromoform	ND
28V		14V	1,1,2-trichloroethane	ND	12V		48V	dichlorobromomethane	ND
23V		15V	1,1,2,2-tetrachloroethane	ND	30V		49V	trichlorofluoromethane	ND
9V		16V	chloroethane	ND	13V		50V	dichlorodifluoromethane	ND
4V		17V	bis (chloromethyl) ether	ND	8V		51V	chlorodibromomethane	ND
10V		19V	2-chloroethylvinyl ether	ND	24V		85V	tetrachloroethylene	ND
11V		23V	chloroform	ND	25V		86V	toluene	ND
16V		29V	1,1-dichloroethylene	ND	29V		87V	trichloroethylene	ND
26V		30V	1,2-trans-dichloroethylene	ND	31V		88V	vinyl chloride	ND

A.6.16.53

RADIAN CORPORATION

RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208
Continued From Above

SAMPLE ID CB

FRACTION 02E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 624, (Federal Register, 12/3/79).

A-6-17-53

SAMPLE ID 81-1 SAMPLE # 03 FRACTIONS: A, B, C, D, E, F
Date & Time Collected not specified Category

CNTOTA <.01 mg/L EX_625 07/02/85 (date complete) PHEN_A 0.034 mg/L

A-6.18.53

RADIAN CORPORATION

PAGE 18 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID 81-1 FRACTION 03C TEST CODE C MET NAME Priority Pollutant Metals
Date & Time Collected not specified Category

DATE ANALYZED 07/09/85 VERIFIED BY GMC

Analyzed by ICPES

CODE	METAL	RESULT
AG	Silver	<.002
BE	Beryllium	<.001
CD	Cadmium	<.002
CR	Chromium	<.005
CU	Copper	0.009
NI	Nickel	0.005*
ZN	Zinc	0.020

Analyzed by AA

CODE	METAL	RESULT
AS	Arsenic	<.002
HG	Mercury	0.0008*
PB	Lead	<.001
SE	Selenium	<.002
SB	Antimony	<.002
TL	Thallium	<.003

NOTES AND DEFINITIONS FOR THIS REPORT

All results reported in ug/ml unless otherwise specified.
NA = not analyzed
* = less that 5 times the detection limit.

A-6-19.53

RADIAN CORPORATION

PAGE 19 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID 81-1 FRACTION 03D TEST CODE M625 A NAME Method 625 Acid Compounds
Date & Time Collected not specified Category

DATA FILE 2CU06208C03 DATE EXTRACTED 07/02/85 ANALYST WJL VERIFIED BY LAK
CONC. FACTOR 1 DATE INJECTED 07/12/85 INSTRUMENT COMPOUNDS DETECTED 0

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
11A		21A	2,4,6-trichlorophenol	ND	7A		58A	4-nitrophenol	ND
8A		22A	4-chloro-3-methylphenol	ND	5A		59A	2,4-dinitrophenol	ND
1A		24A	2-chlorophenol	ND	4A		60A	2-methyl-4,6-dinitrophenol	ND
2A		31A	2,4-dichlorophenol	ND	9A		64A	pentachlorophenol	ND
3A		34A	2,4-dimethylphenol	ND	10A		65A	phenol	ND
6A		57A	2-nitrophenol	ND					

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

A-6.20.53

RADIAN CORPORATION

RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208

SAMPLE ID 81-1 FRACTION 03D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

DATA FILE 2CU06208C03 DATE EXTRACTED 07/02/85 ANALYST WJL VERIFIED BY LAK
CONC. FACTOR 1 DATE INJECTED 07/12/85 INSTRUMENT COMPOUNDS DETECTED 2

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
1B		1B	acenaphthene	ND	41B		61B	N-nitrosodimethylamine	ND
4B		5B	benzidine	ND	43B		62B	N-nitrosodiphenylamine	ND
46B		8B	1,2,4-trichlorobenzene	ND	42B		63B	N-nitrosodi-n-propylamine	ND
33B		9B	hexachlorobenzene	ND	13B	1609	66B	bis(2-ethylhexyl)phthalate	6
36B		12B	hexachloroethane	ND	15B		67B	butyl benzyl phthalate	ND
11B		18B	bis(2-chloroethyl)ether	ND	26B	1264	68B	di-butyl phthalate	B
16B		20B	2-chloronaphthalene	ND	29B		69B	di-n-octyl phthalate	ND
20B		25B	1,2-dichlorobenzene	ND	24B		70B	diethyl phthalate	ND
21B		26B	1,3-dichlorobenzene	ND	25B		71B	dimethyl phthalate	ND
22B		27B	1,4-dichlorobenzene	ND	5B		72B	benzo(a)anthracene A	ND
23B		28B	3,3'dichlorobenzidine	ND	6B		73B	benzo(a)pyrene	ND
27B		35B	2,4-dinitrotoluene	ND	7B		74B	benzo(b)fluoranthene *	ND
28B		36B	2,6-dinitrotoluene	ND	9B		75B	benzo(k)fluoranthene *	
29B		37B	1,2-diphenylhydrazine	ND	18B		76B	chrysene A	
31B		39B	fluoranthene	ND	2B		77B	acenaphth··	6
17B		40B	4-chlorophenyl phenyl ether	ND	3B		78B	anthracen	ND

A-6-21-53

SAMPLE ID 81-1 FRACTION 03D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

14B	41B	4-bromophenyl phenyl ether	ND	8B	79B	benzo(ghi)perylene	ND
12B	42B	bis(2-chloroisopropyl)ether	ND	32B	80B	fluorene	ND
10B	43B	bis(2-chloroethoxy)methane	ND	44B	81B	phenanthrene B	ND
34B	52B	hexachlorobutadiene	ND	19B	82B	dibenzo(a,h)anthracene	ND
35B	53B	hexachlorocyclopentadiene	ND	37B	83B	indeno(1,2,3-cd)pyrene	ND
38B	54B	isophorone	ND	45B	84B	pyrene	ND
39B	55B	naphthalene	ND				
40B	56B	nitrobenzene	ND				

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ug/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

* = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

B = anthracene and phenanthrene co-elute in high concentrations.

A-6.22.53

KADIAN CORPORATION

PAGE 22 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID 81-1 FRACTION 03E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

DATA FILE 4CV06208V03 DATE INJECTED 07/09/85 ANALYST SF VERIFIED BY LAK
CONC. FACTOR 1 INSTRUMENT F4 COMPOUNDS DETECTED 1

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
1V		2V	acrolein	ND	17V		32V	1,2-dichloropropane	ND
2V		3V	acrylonitrile	ND	18V		33V	cis-1,3-dichloropropylene	ND
3V		4V	benzene	ND	18V		33V	trans-1,3-dichloropropylene	ND
6V		6V	carbon tetrachloride	ND	19V		38V	ethylbenzene	ND
7V		7V	chlorobenzene	ND	22V		44V	methylene chloride	ND
15V		10V	1,2-dichloroethane	ND	21V		45V	methyl chloride	ND
27V		11V	1,1,1-trichloroethane	ND	20V		46V	methyl bromide	ND
14V		13V	1,1-dichloroethane	ND	5V		47V	bromoform	ND
28V		14V	1,1,2-trichloroethane	ND	12V		48V	dichlorobromomethane	ND
23V		15V	1,1,2,2-tetrachloroethane	ND	30V		49V	trichlorofluoromethane	ND
9V		16V	chloroethane	ND	13V		50V	dichlorodifluoromethane	ND
4V		17V	bis (chloromethyl) ether	ND	8V		51V	chlorodibromomethane	ND
10V		19V	2-chloroethylvinyl ether	ND	24V		85V	tetrachloroethylene	ND
11V		23V	chloroform	ND	25V		86V	toluene	ND
16V		29V	1,1-dichloroethylene	ND	29V	301	87V	trichloroethylene	6
26V		30V	1,2-trans-dichloroethylene	ND	31V		88V	vinyl chloride	ND

A-6.23.53

RADIAN CORPORATION

RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208
Continued From Above

SAMPLE ID 81-1

FRACTION 03E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 624, (Federal Register, 12/3/79).

A-6.24.53

KADIAN CORPORATION

PAGE 24 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID 81-A SAMPLE # 04 FRACTIONS: A, B, C, D, E, F
Date & Time Collected not specified Category

CNTOTA < .01 mg/L EX 625 07/02/85 (date complete) PHEN_A 0.023 mg/L

A-6-25-53

RADIAN CORPORATION

PAGE 25 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID 81-A FRACTION 04C TEST CODE C MET NAME Priority Pollutant Metals
Date & Time Collected not specified Category

DATE ANALYZED 07/09/85 VERIFIED BY GMC

Analyzed by ICPES

CODE	METAL	RESULT
AG	Silver	<.002
BE	Beryllium	<.001
CD	Cadmium	<.002
CR	Chromium	0.006*
CU	Copper	0.018
NI	Nickel	0.024
ZN	Zinc	<.003

Analyzed by AA

CODE	METAL	RESULT
AS	Arsenic	<.002
HG	Mercury	0.0018
PB	Lead	<.001
SE	Selenium	<.002
SB	Antimony	<.002
TL	Thallium	<.003

NOTES AND DEFINITIONS FOR THIS REPORT

All results reported in ug/ml unless otherwise specified.
NA = not analyzed
* = less that 5 times the detection limit.

A-6.26.53

RADIAN CORPORATION

PAGE 26 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID 81-A FRACTION 04D TEST CODE M625 A NAME Method 625 Acid Compounds
Date & Time Collected not specified Category

DATA FILE 2CU06208C04 DATE EXTRACTED 07/02/85 ANALYST WJL VERIFIED BY LAK
CONC. FACTOR 1 DATE INJECTED 07/12/85 INSTRUMENT COMPOUNDS DETECTED 1

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
11A		21A	2,4,6-trichlorophenol	ND	7A		58A	4-nitrophenol	ND
8A		22A	4-chloro-3-methylphenol	ND	5A		59A	2,4-dinitrophenol	ND
1A		24A	2-chlorophenol	ND	4A		60A	2-methyl-4,6-dinitrophenol	ND
2A		31A	2,4-dichlorophenol	ND	9A		64A	pentachlorophenol	ND
3A		34A	2,4-dimethylphenol	ND	10A	432	65A	phenol	7
6A		57A	2-nitrophenol	ND					

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

A-6-2753

KAUFMAN CORPORATION

PAGE 27 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID 81-A FRACTION 04D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

DATA FILE 2CU06208C04 DATE EXTRACTED 07/02/85 ANALYST WJL VERIFIED BY LAK
CONC. FACTOR 1 DATE INJECTED 07/12/85 INSTRUMENT COMPOUNDS DETECTED 2

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
1B		1B	acenaphthene	ND	41B		61B	N-nitrosodimethylamine	ND
4B		5B	benzidine	ND	43B		62B	N-nitrosodiphenylamine	ND
46B		8B	1,2,4-trichlorobenzene	ND	42B		63B	N-nitrosodi-n-propylamine	ND
33B		9B	hexachlorobenzene	ND	13B	1610	66B	bis(2-ethylhexyl)phthalate	42
36B		12B	hexachloroethane	ND	15B		67B	butyl benzyl phthalate	ND
11B		18B	bis(2-chloroethyl)ether	ND	26B	1265	68B	di-butyl phthalate	5
16B		20B	2-chloronaphthalene	ND	29B		69B	di-n-octyl phthalate	ND
20B		25B	1,2-dichlorobenzene	ND	24B		70B	diethyl phthalate	ND
21B		26B	1,3-dichlorobenzene	ND	25B		71B	dimethyl phthalate	ND
22B		27B	1,4-dichlorobenzene	ND	5B		72B	benzo(a)anthracene A	ND
23B		28B	3,3'dichlorobenzidine	ND	6B		73B	benzo(a)pyrene	ND
27B		35B	2,4-dinitrotoluene	ND	7B		74B	benzo(b)fluoranthene *	ND
28B		36B	2,6-dinitrotoluene	ND	9B		75B	benzo(k)fluoranthene *	ND
29B		37B	1,2-diphenylhydrazine	ND	18B		76B	chrysene A	ND
31B		39B	fluoranthene	ND	2B		77B	acenaphthylene	ND
17B		40B	4-chlorophenyl phenyl ether	ND	3B		78B	anthracene B	ND

A-6.28.53

RADIAN CORPORATION

PAGE 28 | Analytical Serv REPORT | LAB # 85-06-208
RECEIVED: 06/28/85 | Results by Sample | Continued From Above

SAMPLE ID 81-A FRACTION 04D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

14B	41B	4-bromophenyl phenyl ether	ND	8B	79B	benzo(ghi)perylene	ND
12B	42B	bis(2-chloroisopropyl)ether	ND	32B	80B	fluorene	ND
10B	43B	bis(2-chloroethoxy)methane	ND	44B	81B	phenanthrene B	ND
34B	52B	hexachlorobutadiene	ND	19B	82B	dibenzo(a,h)anthracene	ND
35B	53B	hexachlorocyclopentadiene	ND	37B	83B	indeno(1,2,3-cd)pyrene	ND
38B	54B	isophorone	ND	45B	84B	pyrene	ND
39B	55B	naphthalene	ND				
40B	56B	nitrobenzene	ND				

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ug/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

* = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

B = anthracene and phenanthrene co-elute in high concentrations.

A-6.29.53

RADIAN CORPORATION

PAGE 29 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID 81-A FRACTION 04E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

DATA FILE 4CU06208V04 DATE INJECTED 07/09/85 ANALYST SF VERIFIED BY LAK
CONC. FACTOR 1 INSTRUMENT F4 COMPOUNDS DETECTED 1

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
1V		2V	acrolein	ND	17V		32V	1,2-dichloropropane	ND
2V		3V	acrylonitrile	ND	18V		33V	cis-1,3-dichloropropylene	ND
3V		4V	benzene	ND	18V		33V	trans-1,3-dichloropropylene	ND
6V		6V	carbon tetrachloride	ND	19V		38V	ethylbenzene	ND
7V		7V	chlorobenzene	ND	22V		44V	methylene chloride	ND
15V		10V	1,2-dichloroethane	ND	21V		45V	methyl chloride	ND
27V		11V	1,1,1-trichloroethane	ND	20V		46V	methyl bromide	ND
14V		13V	1,1-dichloroethane	ND	5V		47V	bromoform	ND
28V		14V	1,1,2-trichloroethane	ND	12V		48V	dichlorobromomethane	ND
23V		15V	1,1,2,2-tetrachloroethane	ND	30V		49V	trichlorofluoromethane	ND
9V		16V	chloroethane	ND	13V		50V	dichlorodifluoromethane	ND
4V		17V	bis (chloromethyl) ether	ND	8V		51V	chlorodibromomethane	ND
10V		19V	2-chloroethylvinyl ether	ND	24V		85V	tetrachloroethylene	ND
11V		23V	chloroform	ND	25V		86V	toluene	ND
16V		29V	1,1-dichloroethylene	ND	29V	301	87V	trichloroethylene	3
26V		30V	1,2-trans-dichloroethylene	ND	31V		88V	vinyl chloride	ND

A-6.30.53

RADIAN CORPORATION

RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208
Continued From Above

SAMPLE ID 81-A

FRACTION 04E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 624. (Federal Register, 12/3/79).

A-6.31.53

KAISER CORPORATION

PAGE 31 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID 81-C SAMPLE # 05 FRACTIONS: A, B, C, D, E, F
Date & Time Collected not specified Category

CNTOTA <.01 mg/L EX 625 07/02/85 date complete PHEN_A <.005 mg/L

A-6-32.53

KADIAN CORPORATION

PAGE 32 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID 81-C FRACTION 05C TEST CODE C MET NAME Priority Pollutant Metals
Date & Time Collected not specified Category

DATE ANALYZED 07/09/85 VERIFIED BY GMC

Analyzed by ICPES

CODE	METAL	RESULT
AG	Silver	<.002
BE	Beryllium	<.001
CD	Cadmium	<.002
CR	Chromium	0.007*
CU	Copper	0.020
NI	Nickel	0.027
ZN	Zinc	0.016

Analyzed by AA

CODE	METAL	RESULT
AS	Arsenic	<.002
HG	Mercury	0.0008*
PB	Lead	<.001
SE	Selenium	<.002
SB	Antimony	0.004*
TL	Thallium	<.003

NOTES AND DEFINITIONS FOR THIS REPORT

All results reported in ug/ml unless otherwise specified.
NA = not analyzed
* = less that 5 times the detection limit.

A-6.33.53

RADIAN CORPORATION

PAGE 33 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID 81-C FRACTION 05D TEST CODE M625 A NAME Method 625 Acid Compounds
Date & Time Collected not specified Category

DATA FILE 2CU06208C05 DATE EXTRACTED 07/02/85 ANALYST WJL VERIFIED BY LAK
CONC. FACTOR 1 DATE INJECTED 07/12/85 INSTRUMENT COMPOUNDS DETECTED 0

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
11A		21A	2,4,6-trichlorophenol	ND	7A		58A	4-nitrophenol	ND
8A		22A	4-chloro-3-methylphenol	ND	5A		59A	2,4-dinitrophenol	ND
1A		24A	2-chlorophenol	ND	4A		60A	2-methyl-4,6-dinitrophenol	ND
2A		31A	2,4-dichlorophenol	ND	9A		64A	pentachlorophenol	ND
3A		34A	2,4-dimethylphenol	ND	10A		65A	phenol	ND
6A		57A	2-nitrophenol	ND					

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

A-6.34.53

RADIAN CORPORATION

RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208

SAMPLE ID 81-C FRACTION 05D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

DATA FILE 2CU06208C05 DATE EXTRACTED 07/02/85 ANALYST WJL VERIFIED BY LAK
CONC. FACTOR 1 DATE INJECTED 07/12/85 INSTRUMENT 1 COMPOUNDS DETECTED 2

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
1B		1B	acenaphthene	ND	41B		61B	N-nitrosodimethylamine	ND
4B		5B	benzidine	ND	43B		62B	N-nitrosodiphenylamine	ND
46B		8B	1,2,4-trichlorobenzene	ND	42B		63B	N-nitrosodi-n-propylamine	ND
33B		9B	hexachlorobenzene	ND	13B	1609	66B	bis(2-ethylhexyl)phthalate	10
36B		12B	hexachloroethane	ND	15B		67B	butyl benzyl phthalate	ND
11B		18B	bis(2-chloroethyl)ether	ND	26B	1264	68B	di-butyl phthalate	3
16B		20B	2-chloronaphthalene	ND	29B		69B	di-n-octyl phthalate	ND
20B		25B	1,2-dichlorobenzene	ND	24B		70B	diethyl phthalate	ND
21B		26B	1,3-dichlorobenzene	ND	25B		71B	dimethyl phthalate	ND
22B		27B	1,4-dichlorobenzene	ND	5B		72B	benzo(a)anthracene A	ND
23B		28B	3,3'dichlorobenzidine	ND	6B		73B	benzo(a)pyrene	ND
27B		35B	2,4-dinitrotoluene	ND	7B		74B	benzo(b)fluoranthene *	ND
28B		36B	2,6-dinitrotoluene	ND	9B		75B	benzo(k)fluoranthene *	ND
29B		37B	1,2-diphenylhydrazine	ND	18B		76B	chrysene A	ND
31B		39B	fluoranthene	ND	2B		77B	acenaphthylene	ND
17B		40B	4-chlorophenyl phenyl ether	ND	3B		78B	anthracene B	ND

A-6.35.53

RADIAN CORPORATION

RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208
Continued From Above

SAMPLE ID 81-C FRACTION 05D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

14B	41B	4-bromophenyl phenyl ether	ND	8B	79B	benzo(ghi)perylene	ND
12B	42B	bis(2-chloroisopropyl)ether	ND	32B	80B	fluorene	ND
10B	43B	bis(2-chloroethoxy)methane	ND	44B	81B	phenanthrene B	ND
34B	52B	hexachlorobutadiene	ND	19B	82B	dibenzo(a,h)anthracene	ND
35B	53B	hexachlorocyclopentadiene	ND	37B	83B	indeno(1,2,3-cd)pyrene	ND
38B	54B	isophorone	ND	45B	84B	pyrene	ND
39B	55B	naphthalene	ND				
40B	56B	nitrobenzene	ND				

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ug/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

* = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

B = anthracene and phenanthrene co-elute in high concentrations..

A-6.36.53

KADIAN CORPORATION

PAGE 36 Analytical Serv REPORT . LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID 81-C FRACTION 05E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

DATA FILE 4CU06208V05 DATE INJECTED 07/09/85 ANALYST SF VERIFIED BY LAK
CONC. FACTOR 1 INSTRUMENT F4 COMPOUNDS DETECTED 2

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
1V		2V	acrolein	ND	17V		32V	1,2-dichloropropane	ND
2V		3V	acrylonitrile	ND	18V		33V	cis-1,3-dichloropropylene	ND
3V		4V	benzene	ND	18V		33V	trans-1,3-dichloropropylene	ND
6V		6V	carbon tetrachloride	ND	19V		38V	ethylbenzene	ND
7V		7V	chlorobenzene	ND	22V		44V	methylene chloride	ND
15V		10V	1,2-dichloroethane	ND	21V		45V	methyl chloride	ND
27V		11V	1,1,1-trichloroethane	ND	20V		46V	methyl bromide	ND
14V		13V	1,1-dichloroethane	ND	5V		47V	bromoform	ND
28V		14V	1,1,2-trichloroethane	ND	12V		48V	dichlorobromomethane	ND
23V		15V	1,1,2,2-tetrachloroethane	ND	30V		49V	trichlorofluoromethane	ND
9V		16V	chloroethane	ND	13V		50V	dichlorodifluoromethane	ND
4V		17V	bis (chloromethyl) ether	ND	8V		51V	chlorodibromomethane	ND
10V		19V	2-chloroethylvinyl ether	ND	24V		85V	tetrachloroethylene	ND
11V	83	23V	chloroform	4	25V		86V	toluene	ND
16V		29V	1,1-dichloroethylene	ND	29V	301	87V	trichloroethylene	5
26V		30V	1,2-trans-dichloroethylene	ND	31V		88V	vinyl chloride	ND

A-C-3753

KAUFMAN CORPORATION

PAGE 37 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample Continued From Above

SAMPLE ID 81-C FRACTION 05E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 624, (Federal Register, 12/3/79).

A-6.36.53

KADIAN CORPORATION

PAGE 38 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID CW SAMPLE # 06 FRACTIONS: A, B, C, D, E, F
Date & Time Collected not specified Category

CNTOTA <.01 mg/L EX_625 07/02/85 date complete PHEN_A <.005 mg/L

X-6.35.53

Analytical Serv REPORT

LAB # 85-06-208

RECEIVED: 06/28/85

Results by Sample

SAMPLE ID CW FRACTION 06C TEST CODE C MET NAME Priority Pollutant Metals

Date & Time Collected not specified Category

DATE ANALYZED 07/09/85 VERIFIED BY GMC

Analyzed by ICPES

CODE	METAL	RESULT
AG	Silver	0.004*
BE	Beryllium	<.001
CD	Cadmium	<.002
CR	Chromium	0.008*
CU	Copper	0.005*
NI	Nickel	<.003
ZN	Zinc	0.006*

Analyzed by AA

CODE	METAL	RESULT
AS	Arsenic	<.002
HG	Mercury	0.0006*
PB	Lead	<.001
SE	Selenium	<.002
SB	Antimony	<.002
TL	Thallium	<.003

NOTES AND DEFINITIONS FOR THIS REPORT

All results reported in ug/ml unless otherwise specified.
NA = not analyzed
* = less that 5 times the detection limit.

A-6-4053

RADIAN CORPORATION

PAGE 40 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID CW FRACTION 06D TEST CODE M625 A NAME Method 625 Acid Compounds
Date & Time Collected not specified Category

DATA FILE 2CU06208C06 DATE EXTRACTED 07/02/85 ANALYST WJL VERIFIED BY LAK
CONC. FACTOR 1 DATE INJECTED 07/12/85 INSTRUMENT COMPOUNDS DETECTED 0

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
11A		21A	2,4,6-trichlorophenol	ND	7A		58A	4-nitrophenol	ND
8A		22A	4-chloro-3-methylphenol	ND	5A		59A	2,4-dinitrophenol	ND
1A		24A	2-chlorophenol	ND	4A		60A	2-methyl-4,6-dinitrophenol	ND
2A		31A	2,4-dichlorophenol	ND	9A		64A	pentachlorophenol	ND
3A		34A	2,4-dimethylphenol	ND	10A		65A	phenol	ND
6A		57A	2-nitrophenol	ND					

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

A-6.4453

RADIAN CORPORATION

PAGE 41 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID CW FRACTION 06D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

DATA FILE 2CU06208C06 DATE EXTRACTED 07/03/85 ANALYST WJL VERIFIED BY LAK
CONC. FACTOR 1 DATE INJECTED 07/12/85 INSTRUMENT COMPOUNDS DETECTED 2

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
1B		1B	acenaphthene	ND	41B		61B	N-nitrosodimethylamine	ND
4B		5B	benzidine	ND	43B		62B	N-nitrosodiphenylamine	ND
46B		8B	1,2,4-trichlorobenzene	ND	42B		63B	N-nitrosodi-n-propylamine	ND
33B		9B	hexachlorobenzene	ND	13B	1610	66B	bis(2-ethylhexyl)phthalate	7
36B		12B	hexachloroethane	ND	15B		67B	butyl benzyl phthalate	ND
11B		18B	bis(2-chloroethyl)ether	ND	26B	1265	68B	di-butyl phthalate	7
16B		20B	2-chloronaphthalene	ND	29B		69B	di-n-octyl phthalate	ND
20B		25B	1,2-dichlorobenzene	ND	24B		70B	diethyl phthalate	ND
21B		26B	1,3-dichlorobenzene	ND	25B		71B	dimethyl phthalate	ND
22B		27B	1,4-dichlorobenzene	ND	5B		72B	benzo(a)anthracene A	ND
23B		28B	3,3'dichlorobenzidine	ND	6B		73B	benzo(a)pyrene	ND
27B		35B	2,4-dinitrotoluene	ND	7B		74B	benzo(b)fluoranthene *	ND
28B		36B	2,6-dinitrotoluene	ND	9B		75B	benzo(k)fluoranthene *	ND
29B		37B	1,2-diphenylhydrazine	ND	18B		76B	chrysene A	ND
31B		39B	fluoranthene	ND	2B		77B	acenaphthylene	ND
17B		40B	4-chlorophenyl phenyl ether	ND	3B		78B	anthracene B	ND

A-6.42.53

KADIAN CORPORATION

RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208
Continued From Above

SAMPLE ID CW FRACTION 06D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

14B	41B	4-bromophenyl phenyl ether	ND	8B	79B	benzo(ghi)perylene	ND
12B	42B	bis(2-chloroisopropyl)ether	ND	32B	80B	fluorene	ND
10B	43B	bis(2-chloroethoxy)methane	ND	44B	81B	phenanthrene B	ND
34B	52B	hexachlorobutadiene	ND	19B	82B	dibenzo(a,h)anthracene	ND
35B	53B	hexachlorocyclopentadiene	ND	37B	83B	indeno(1,2,3-cd)pyrene	ND
38B	54B	isophorone	ND	45B	84B	pyrene	ND
39B	55B	naphthalene	ND				
40B	56B	nitrobenzene	ND				

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ug/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

* = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

B = anthracene and phenanthrene co-elute in high concentrations.

A-6-43-53

KAUMAN CORPORATION

PAGE 43 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID CW FRACTION 06E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

DATA FILE 4CU06208V06 DATE INJECTED 07/09/85 ANALYST SF VERIFIED BY LAK
CONC. FACTOR 1 INSTRUMENT F4 COMPOUNDS DETECTED 0

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
1V		2V	acrolein	ND	17V		32V	1,2-dichloropropane	ND
2V		3V	acrylonitrile	ND	18V		33V	cis-1,3-dichloropropylene	ND
3V		4V	benzene	ND	18V		33V	trans-1,3-dichloropropylene	ND
6V		6V	carbon tetrachloride	ND	19V		38V	ethylbenzene	ND
7V		7V	chlorobenzene	ND	22V		44V	methylene chloride	ND
15V		10V	1,2-dichloroethane	ND	21V		45V	methyl chloride	ND
27V		11V	1,1,1-trichloroethane	ND	20V		46V	methyl bromide	ND
14V		13V	1,1-dichloroethane	ND	5V		47V	bromoform	ND
28V		14V	1,1,2-trichloroethane	ND	12V		48V	dichlorobromomethane	ND
23V		15V	1,1,2,2-tetrachloroethane	ND	30V		49V	trichlorofluoromethane	ND
9V		16V	chloroethane	ND	13V		50V	dichlorodifluoromethane	ND
4V		17V	bis (chloromethyl) ether	ND	8V		51V	chlorodibromomethane	ND
10V		19V	2-chloroethylvinyl ether	ND	24V		85V	tetrachloroethylene	ND
11V		23V	chloroform	ND	25V		86V	toluene	ND
16V		29V	1,1-dichloroethylene	ND	29V		87V	trichloroethylene	ND
26V		30V	1,2-trans-dichloroethylene	ND	31V		88V	vinyl chloride	ND

4-6-44-53

RADIAN CORPORATION

PAGE 44 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample Continued From Above

SAMPLE ID CW FRACTION 06E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 624, (Federal Register, 12/3/79).

A-6.45.53

RADIAN CORPORATION

RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208

SAMPLE ID WW SAMPLE # 07 FRACTIONS: A, B, C, D, E
Date & Time Collected not specified Category

CNTOTA <.01 mg/L EX_625 07/02/85 date complete PHEN_A <.005 mg/L

A-6.46.53

KADIAN CORPORATION

PAGE 46 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85
Results by Sample

SAMPLE ID WW FRACTION 07C TEST CODE C MET NAME Priority Pollutant Metals
Date & Time Collected not specified Category

DATE ANALYZED 07/09/85 VERIFIED BY GMC

Analyzed by ICPES

CODE	METAL	RESULT
AG	Silver	<.002
BE	Beryllium	<.001
CD	Cadmium	<.002
CR	Chromium	<.005
CU	Copper	0.003*
NI	Nickel	<.003
ZN	Zinc	<.003

Analyzed by AA

CODE	METAL	RESULT
AS	Arsenic	<.002
HG	Mercury	0.0006*
PB	Lead	<.001
SE	Selenium	<.002
SB	Antimony	<.002
TL	Thallium	<.003

NOTES AND DEFINITIONS FOR THIS REPORT

All results reported in ug/ml unless otherwise specified.
NA = not analyzed
* = less that 5 times the detection limit.

A-6-47-53

KAUFMAN CORPORATION

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RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208

SAMPLE ID WW

FRACTION 07D TEST CODE M625 A NAME Method 625 Acid Compounds
Date & Time Collected not specified Category

DATA FILE 2CU06208C07
CONC. FACTOR 1

DATE EXTRACTED 07/03/85
DATE INJECTED 07/12/85

ANALYST WJL
INSTRUMENT

VERIFIED BY LAK
COMPOUNDS DETECTED 0

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
11A		21A	2,4,6-trichlorophenol	ND	7A		58A	4-nitrophenol	ND
8A		22A	4-chloro-3-methylphenol	ND	5A		59A	2,4-dinitrophenol	ND
1A		24A	2-chlorophenol	ND	4A		60A	2-methyl-4,6-dinitrophenol	ND
2A		31A	2,4-dichlorophenol	ND	9A		64A	pentachlorophenol	ND
3A		34A	2,4-dimethylphenol	ND	10A		65A	phenol	ND
6A		57A	2-nitrophenol	ND					

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

A-6-48-53

KADIAN CORPORATION

RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208

SAMPLE ID WW FRACTION 07D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

DATA FILE 2CU06208C07 DATE EXTRACTED 07/03/85 ANALYST WJL VERIFIED BY LAK
CONC. FACTOR 1 DATE INJECTED 07/12/85 INSTRUMENT COMPOUNDS DETECTED 2

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
1B		1B	acenaphthene	ND	41B		61B	N-nitrosodimethylamine	ND
4B		5B	benzidine	ND	43B		62B	N-nitrosodiphenylamine	ND
46B		8B	1,2,4-trichlorobenzene	ND	42B		63B	N-nitrosodi-n-propylamine	ND
33B		9B	hexachlorobenzene	ND	13B	1605	66B	bis(2-ethylhexyl)phthalate	24
36B		12B	hexachloroethane	ND	15B		67B	butyl benzyl phthalate	ND
11B		18B	bis(2-chloroethyl)ether	ND	26B	1261	68B	di-butyl phthalate	3
16B		20B	2-chloronaphthalene	ND	29B		69B	di-n-octyl phthalate	ND
20B		25B	1,2-dichlorobenzene	ND	24B		70B	diethyl phthalate	ND
21B		26B	1,3-dichlorobenzene	ND	25B		71B	dimethyl phthalate	ND
22B		27B	1,4-dichlorobenzene	ND	5B		72B	benzo(a)anthracene A	ND
23B		28B	3,3'dichlorobenzidine	ND	6B		73B	benzo(a)pyrene	ND
27B		35B	2,4-dinitrotoluene	ND	7B		74B	benzo(b)fluoranthene *	ND
28B		36B	2,6-dinitrotoluene	ND	9B		75B	benzo(k)fluoranthene *	ND
29B		37B	1,2-diphenylhydrazine	ND	18B		76B	chrysene A	ND
31B		39B	fluoranthene	ND	2B		77B	acenaphthylene	ND
17B		40B	4-chlorophenyl phenyl ether	ND	3B		78B	anthracene B	ND

A-6-49-53

SAMPLE ID WW FRACTION 07D TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected not specified Category

14B	41B	4-bromophenyl phenyl ether	ND	8B	79B	benzo(ghi)perylene	ND
12B	42B	bis(2-chloroisopropyl)ether	ND	32B	80B	fluorene	ND
10B	43B	bis(2-chloroethoxy)methane	ND	44B	81B	phenanthrene B	ND
34B	52B	hexachlorobutadiene	ND	19B	82B	dibenzo(a,h)anthracene	ND
35B	53B	hexachlorocyclopentadiene	ND	37B	83B	indeno(1,2,3-cd)pyrene	ND
38B	54B	isophorone	ND	45B	84B	pyrene	ND
39B	55B	naphthalene	ND				
40B	56B	nitrobenzene	ND				

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ug/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

* = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

B = anthracene and phenanthrene co-elute in high concentrations.

A-6-5053

RADIAN CORPORATION

PAGE 50 Analytical Serv REPORT LAB # 85-06-208
RECEIVED: 06/28/85 Results by Sample

SAMPLE ID WW FRACTION 07E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

DATA FILE 4CU06208V07 DATE INJECTED 07/10/85 ANALYST SF VERIFIED BY LAK
CONC. FACTOR 1 INSTRUMENT F4 COMPOUNDS DETECTED 2

NPDES	SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
1V		2V	acrolein	ND	17V		32V	1,2-dichloropropane	ND
2V		3V	acrylonitrile	ND	18V		33V	cis-1,3-dichloropropylene	ND
3V		4V	benzene	ND	18V		33V	trans-1,3-dichloropropylene	ND
6V		6V	carbon tetrachloride	ND	19V		38V	ethylbenzene	ND
7V		7V	chlorobenzene	ND	22V		44V	methylene chloride	ND
15V		10V	1,2-dichloroethane	ND	21V		45V	methyl chloride	ND
27V		11V	1,1,1-trichloroethane	ND	20V		46V	methyl bromide	ND
14V		13V	1,1-dichloroethane	ND	5V		47V	bromoform	ND
28V		14V	1,1,2-trichloroethane	ND	12V		48V	dichlorobromomethane	ND
23V		15V	1,1,2,2-tetrachloroethane	ND	30V		49V	trichlorofluoromethane	ND
9V		16V	chloroethane	ND	13V		50V	dichlorodifluoromethane	ND
4V		17V	bis (chloromethyl) ether	ND	8V		51V	chlorodibromomethane	ND
10V		19V	2-chloroethylvinyl ether	ND	24V		85V	tetrachloroethylene	ND
11V	202	23V	chloroform	7	25V		86V	toluene	ND
16V		29V	1,1-dichloroethylene	ND	29V	300	87V	trichloroethylene	6
26V		30V	1,2-trans-dichloroethylene	ND	31V		88V	vinyl chloride	ND

A-6-51-53

KADIAN CORPORATION

PAGE 51
RECEIVED: 06/28/85

Analytical Serv REPORT
Results by Sample

LAB # 85-06-208
Continued From Above

SAMPLE ID WW

FRACTION 07E TEST CODE MS 624 NAME EPA Method 624/GC-MS
Date & Time Collected not specified Category

NOTES AND DEFINITIONS FOR THIS REPORT.
SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.
ND = not detected at EPA detection limit method 624, (Federal Register, 12/3/79).

A-6-52-C

KADIAN CORPORATION

RECEIVED: 06/28/85

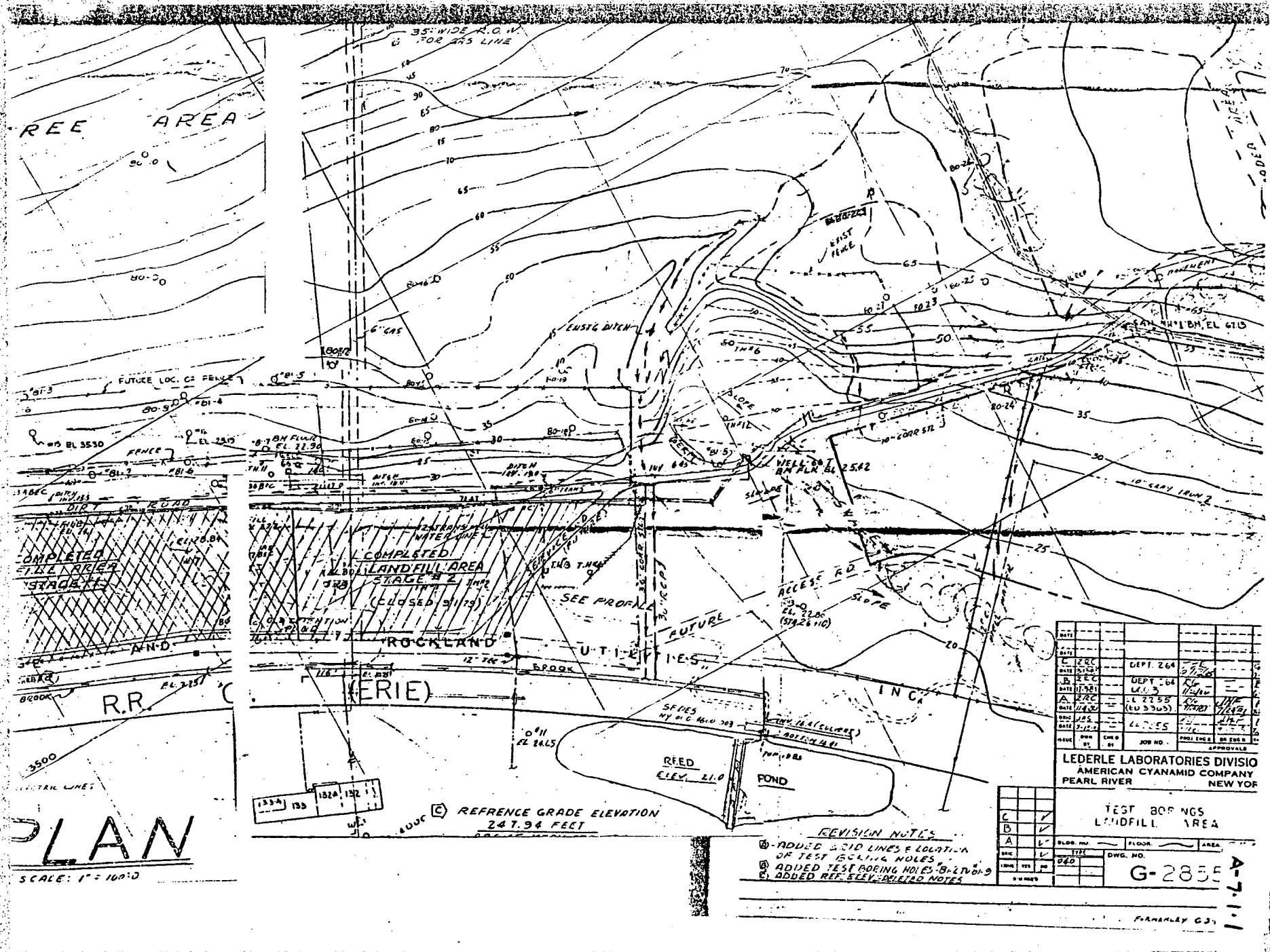
Analytical Serv REPORT
NonReported Work

LAB # 85-06-208

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

01F	I	DUP624
02F	I	DUP624
03F	I	DUP624
04F	I	DUP624
05F	I	DUP624
06F	I	DUP624

A-6.53.53


35' WIDE R.O.W. FOR GAS LINE
EXIST FENCE
EXIST DITCH
FUTURE LOC. OF FENCE
6" GAS
SAN MH'L BM, EL 67.0
WELL 68 BM FLR EL 25.62
10" GRAY IRON
ACCESS RD.
SLOPE
SEE PROFILE
FUTURE
UTILITIES
INC.
COMPLETED LANDFILL AREA STAGE #2
(CLOSED 3/1/79)
COMPLETED LANDFILL AREA STAGE #1
DIRT ROAD
ROCKLAND
BROOK
(ERIE)
R.R.
REED
ELEV. 21.0
POND
REFRENCE GRADE ELEVATION
247.94 FEET
PLAN
SCALE: 1" = 100'-0"
REVISION NOTES
A-ADDED GRID LINES & LOCATION OF TEST BORING HOLES
B-ADDED TEST BORING HOLES "B-LT-01-9
C-ADDED REF. ELEV. - SEE 120 NOTES
LEDERLE LABORATORIES DIVISIO
AMERICAN CYANAMID COMPANY
PEARL RIVER NEW YOR
TEST BORINGS
LANDFILL AREA
DWG. NO.
G-2855
A-7-11

A-8.1.1

December 5, 1979

CC: Ms. R. Baruch NA
Mr. R. Brewster
Mr. B. J. Cross
Mr. D. Gabel
Mr. R. Guterl
Mr. J. Merck
Mr. D. E. Wilder
Lederle LF cpm

INSPECTION REPORT

DATE & TIME: Wednesday, November 21, 1979 - 10 a.m.-12 p.m.

LOCATION: Sanitary Landfill Areas 2 & 2A-Sludge & Cake Compost Areas

AREA INSPECTED BY: R. Mansfield, Rockland County Dept. of Health

PERSONNEL INVOLVED: C. Begbie, D. Reihard, T. Reilly (Lederle

1. Sanitary Landfill - Area 2A rated to be in very good condition. Area 2 completed, capped and closed. No citations.

2. Sludge Compost Area - Area rated to be in very good condition. No citations.

3. Cake Compost Area - Area rated to be in very good condition. No citations.

4. Industrial Waste Treatment Plant - 1-Area rated to be in very good condition. No citations. Mr. Mansfield observed that the overhead doors were not being maintained closed and was concerned for odor emissions from these points. It was agreed that there were no odors in evidence at the time of the inspection.

2-Mr. Mansfield indicated a personnel safety concern for the low chain barricades around the clarifiers.

T. J. Reilly

TJR:mb

STATE OF NEW YORK

DEPARTMENT OF CONSERVATION

WATER POWER AND CONTROL COMMISSION

Geology and Ground-Water Resources of Rockland County, New York

With Special Emphasis on the Newark Group (Triassic)

By

NATHANIEL M. PERLMUTTER

Geologist, U. S. Geological Survey

Prepared by the

U. S. GEOLOGICAL SURVEY

in cooperation with the

NEW YORK WATER POWER AND CONTROL COMMISSION

BULLETIN GW-42

ALBANY, N. Y.

1959

A-9.2.11

Topography and Drainage

Two physiographic provinces, the Piedmont province and the New England province (Fenneman, 1938, p. 145–152 and 368–370) are sharply defined topographically in Rockland County. The northwestern or highland part of the county is underlain by crystalline rocks of the Reading Prong extension of the New England province. The part of the highland near the New York-New Jersey boundary commonly is referred to as the Ramapo Mountains and the part near the Hudson River is referred to as the Hudson Highlands. The surface of the upland is rolling and has relatively low relief except in the deep gorges of the Ramapo and Hudson Rivers. The summits are generally at altitudes of 1,100 to 1,200 feet, and the maximum altitude is about 1,300 feet. The eastern face of the upland is a steep escarpment that overlooks a broad lowland to the east.

The lowland in the eastern part of the county is the north end of the Piedmont Lowland section of the Piedmont province. The bedrock consists chiefly of gently-dipping beds of relatively soft sedimentary rocks that have been eroded to form a series of low, northerly-trending ridges separated by narrow valleys. Summit levels on the ridges range in altitude from about 600 feet in the western part of the lowland to about 200 feet in the eastern part. The valleys are incised as much as 150 to 200 feet

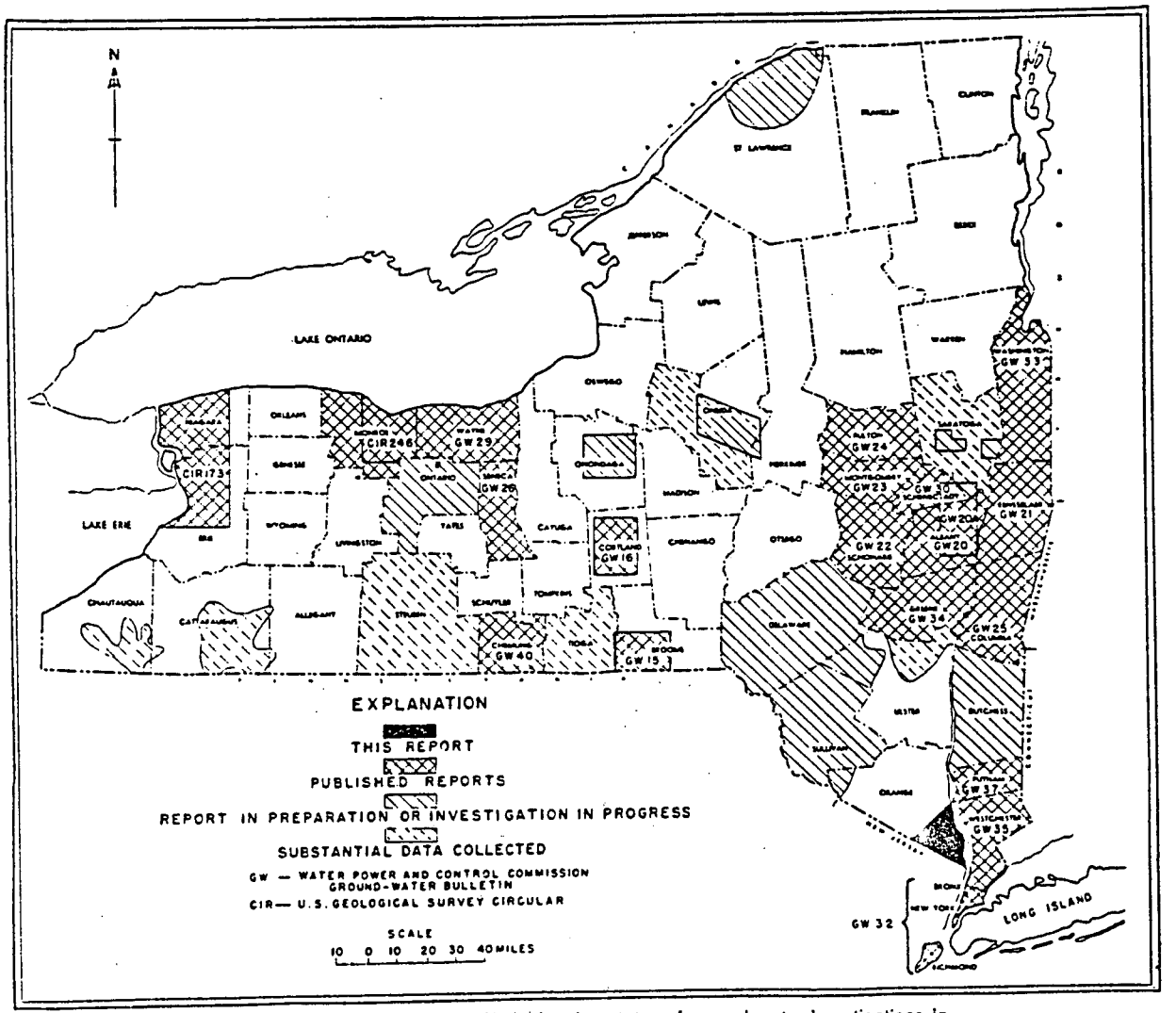


Figure 1.—Index map of New York showing status of ground-water investigations in 1959 and location of Rockland County.

below the crests of the ridges. The eastern slopes of the ridges are somewhat steeper than the western slopes owing to the westerly dip of the beds.

A well-defined ridge of diabase rises above the lowland in eastern Rockland County and roughly follows the trend of the Hudson River as far north as Haverstraw where it curves to the west and terminates several miles from the river. The ridge ranges in width from about 0.5 to 1 mile and in altitude from about 200 feet at the south end to 832 feet near the north end at High Tor, a prominent point just south of Haverstraw. Summit levels on the diabase ridge are about 600 to 700 feet above sea level. The eastern face of the ridge is nearly vertical and in many places the rock is broken along vertical joint planes forming a series of hexagonal columns. The western slope of the ridge is gentle at some places and steep at others. The ridge is cut by several narrow valleys called cloves and by a wide gorge near Piermont through which Sparkill Creek flows east to the Hudson River.

The streams in Rockland County are tributary to the Hudson River, Hackensack River, and Passaic River. In general streams flowing northerly and easterly discharge into the Hudson River, streams flowing southwesterly discharge into the Passaic River, and those flowing southerly discharge into the Hackensack River.

The Hudson River, which forms the boundary between Rockland County and Westchester County, is the largest stream in the area. The river is estuarine in character and the water level has a normal tidal range of about 3 feet in the vicinity of Rockland County. The depth to the river bottom is generally less than 15 feet but in the main channel in the northern part of the county it is more than 100 feet deep in several places. The valley of the Hudson is markedly constricted at the northern and southern extremities of the county and is widest opposite Haverstraw (pl. 1).

Aside from the Hudson River there are 8 other principal streams in the county (pl. 3). The names of the streams and the area of their drainage basins in Rockland County are given in the table below. Of these streams the three largest are the Hackensack River, the Ramapo River, and the Mahwah River.

Principal drainage basins of Rockland County

Name of stream	Area of drainage basin in Rockland County (square miles)
Cedar Pond Brook	14.5
Hackensack River (above dam on Lake DeForest)	27.0
Hackensack River (below dam on Lake DeForest)	23.5
Mahwah River	21.5
Minisceongo Creek	18.9
Pascack Brook	12.3
Ramapo River	26.1
Saddle River	8.0
Sparkill Creek	8.1

The Hackensack River drains an area of about 48 square miles in eastern Rockland County. The discharge from the northern part of the watershed drains into Lake DeForest Reservoir which is controlled by a dam at West Nyack. The reservoir is about 4 miles long, 0.25 to 0.5 mile wide, and has an area of about 1,020 acres. The storage capacity is about 5.6 billion gallons at a water surface of

Table 3.—Geologic units in Rockland County, N. Y., and their water-bearing properties

Class	Age	Geologic unit	Maximum thickness (feet)	Geologic properties	Water-bearing properties
Unconsolidated deposits	Recent	Recent deposits	100±	Chiefly stream and lake deposits composed of brown sand and gravel, brown and gray silt and clay, and organic material. Includes estuarine deposits of silt and clay beneath Hudson River as much as 100 feet thick.	Unimportant as an aquifer owing to thinness and limited distribution. No records of wells obtained.
	Pleistocene	Stratified drift	600±	Stratified brown sand and gravel and interbedded silt and clay, generally less than 100 feet thick; in some places consists mainly of brown and gray varved clay and silt. Thickest deposits in the buried channel of the Hudson River.	Important aquifer locally where deposits are composed of sand and gravel. Yields range from 8 to 1,700 gpm; median yield is 183 gpm; median depth of wells is 26 feet and range is 5 to 170 feet. Layers of silt and clay retard movement of water and cause artesian conditions locally. Water is generally soft to moderately hard. Contaminated by salty water locally along Hudson River shore.
		Till	300±	Unstratified, poorly sorted brown and grayish-brown sand, gravel, boulders, silt, and clay. Occurs principally on hills and in the smaller valleys.	Low permeability. Few records of wells available. Yields average 2 to 3 gpm, mainly from dug wells less than 25 feet deep.
	Unconformity				
Consolidated rocks (bedrock)	Late Triassic	Palisade diabase and minor bodies of igneous rocks	1,000±	Gray and black fine- to coarse-grained diabase intruded as sill or dike; crops out in prominent ridge in eastern part of county. Minor dikes and plugs of diabase in small scattered bodies. Dark gray, fine-grained, body of vesicular igneous rock in western part of county, probably a basaltic flow.	Low porosity and permeability; water occurs in openings along joints and irregular fractures. Median yield of wells is 5 gpm and median depth is 188 feet.
		Newark group (Includes Brunswick and Stockton formations)	10,000±	Chiefly beds of non-marine red and brown sandstone, shale, and conglomerate; in southeastern part of area chiefly beds of gray and red sandstone and arkose with interbedded red shale.	Principal aquifer, low primary porosity; water occurs chiefly in openings along joints and bedding planes. Yields of wells range from 3 gpm to 1,500 gpm. Median yield of large-diameter public-supply wells is 300 gpm and median depth is 407 feet. Water generally is moderately hard.
	Unconformity				
	Cambrian and Ordovician	Cambrian and Ordovician rocks	Unknown	Undifferentiated rocks of limited areal extent. Consist of gray and tan quartzite, gray and blue dolomite and limestone, and dark gray shale and phyllite. Beds are steeply inclined.	Unimportant as an aquifer. Water occurs in openings along joints, bedding planes, and irregular fractures. Median yield of wells is 0 gpm and median depth is 130 feet. Water moderately hard to hard.
	Unconformity				
	Precambrian	Precambrian rocks (Includes equivalents of the Byram gneiss, Losee gneiss, Storm King granite, Pochuck diorite, and Grenville meta-sediments, and some undifferentiated igneous rocks of uncertain age)	Unknown	Gray and pink granite, gneiss, schist, and undifferentiated basic rocks. Rocks closely folded and broken by several major faults; widely exposed.	Minor aquifer. Water contained in openings along joints and irregular fractures. Median yield of wells is 12 gpm and median depth is 105 feet.

The amount of water stored in rocks depends on the porosity or the volume of pore space, which is commonly expressed as a percentage of the total volume of the rock. There are two types of porosity, primary and secondary. Primary porosity is that due to the presence of original openings that came into existence at the time the the rocks were formed. Secondary porosity is that due to openings that formed after the rocks were consolidated. The porosity of unconsolidated deposits is of the primary type and is due almost entirely to the presence of interstices between the constitutent grains. The porosity of consolidated rocks, on the other hand, is mainly of the secondary type and is due chiefly to the presence of openings developed along joints, faults, and other fractures. Consolidated rocks, such as some beds of sandstone and conglomerate, may also have substantial primary porosity. The porosity of beds of well-sorted sand or gravel generally ranges from 25 to 35 percent. In consolidated sedimentary rocks such as those of the Newark group in Rockland County the primary porosity ranges from about 1 to 21 percent (table 5); the secondary porosity is not known. Pore spaces in some rocks may be numerous but very small and poorly interconnected. The permeability of such rocks is low and they do not yield water readily to wells. The permeability is a measure of the capacity of rocks to transmit water. It can be expressed as the number of gallons of water per day that flows through a section of aquifer (water-bearing unit) one foot wide and one foot thick, oriented at right angles to the direction of flow, and under a hydraulic gradient of one foot per foot. The permeability of the rocks in Rockland County ranges from almost zero in parts of the bedrock to an estimated 500 to 1,000 gpd per square foot in stratified sand and gravel.

Under natural conditions, the rate of recharge is balanced by the discharge, except for temporary differences due to changes in the amount of water stored in the aquifer. Withdrawal of water from a well creates a cone of depression in the water level. As the withdrawal continues, the cone of depression deepens and broadens until a balance is reached between recharge, natural discharge, and the withdrawal. When this balance is reached, the water level in the well stabilizes and the cone of depression ceases to expand.

The water-bearing deposits of Rockland County are classified as: (1) consolidated rocks and (2) unconsolidated deposits. The yields and depths of wells penetrating the principal water-bearing units are summarized in table 4 and the geologic and water-bearing characteristics of the principal sources of ground water are described in the following sections.

Ground Water in Consolidated Rocks

The consolidated rocks are the chief source of water in Rockland County. The principal units from oldest to youngest are: (1) Precambrian rocks, (2) Cambrian and Ordovician rocks, (3) Newark group, and (4) Palisade diabase and associated igneous rocks of Triassic age. Of these units, the rocks of the Newark group constitute the principal aquifer.

PRECAMBRIAN ROCKS

Geologic Properties

Crystalline rocks of Precambrian age crop out in a northeast-trending belt of about 70 square miles in the northwestern part of the county (pl. 2). They also form the deeply buried basement beneath the rocks of Triassic age in the eastern part of the county. The crystalline rocks consist predominantly of gray and pink fine- to coarse-grained granite, and gray banded coarse-grained gneiss, and include some dark-colored schist, diorite, ultra-basic igneous rocks, marble, and thin dikes of diabase. Nearly all these crystalline rocks are thought to be of Precambrian age except a few small bodies of ultra-basic igneous rocks such as those of the Cortlandt series which crop out at and near Stony Point and some scattered diabase dikes which are probably younger in age but which have been included with the Precambrian rocks on plate 2 for convenience. The crystalline rocks are intensely folded and faulted and are broken into irregular blocks by joints and other fractures. The openings are generally widest and most numerous near the surface.

A-9-6-11

Table 4.—Comparison of yields and depths of wells in relation to the geologic source of the water

Geologic unit	Yield (gpm)				Depth (feet)			
	No. of wells	Median	Range		No. of wells	Median	Range	
			Low	High			Low	High
Stratified drift	18	183	8	1,500	26	26	5	170
Newark group								
All wells	265	30	3	1,515	337	165	13	805
* Public-supply wells	25	300	150	1,515	25	407	247	655
Palisade diabase	10	5	2	16	12	188	72	770
Cambrian and Ordovician rocks	7	9	3	30	9	130	34	345
Precambrian rocks	32	12	0	180	52	105	25	640

* Production wells of Spring Valley Water Works and Supply Co. Yield of wells based on data from initial pumping tests.

The crystalline bedrock is fresh to only slightly weathered because glaciers scoured the surface and removed soft and highly weathered material during Pleistocene time. Since the end of the Pleistocene epoch a small amount of chemical weathering has taken place along some faults and joints, and at the contacts between the bedrock and the overlying unconsolidated deposits. Major irregularities on the bedrock surface are of preglacial origin and are due mainly to weathering and erosion of the rock along fault zones and joints and to erosion of belts of relatively soft rock by streams. Some preglacial physiographic features were etched out in sharper relief by glacial erosion. The Precambrian rocks are treated as a single unit in the following sections owing to their complex distribution, petrology, and structure, and the general lack of differences among them with respect to their water-bearing characteristics.

Water-bearing Properties

The crystalline rocks are dense and have low porosity, probably less than one percent. Ground water is contained mostly in openings along faults, joints, and irregular fractures. The yield of wells drawing from bedrock depends on the number, size, and degree of interconnection of the openings penetrated by the wells. Relatively high sustained yields can be obtained only where the fractures in the rock are hydraulically connected with a good source of recharge such as a lake, stream, or permeable water-bearing deposits. Drilling to depths greater than about 300 feet is not warranted in most places as the number and size of openings below that depth diminishes rapidly. Studies in other areas underlain by crystalline rocks indicate that, on the average, yields of wells in valleys are higher than the yields of wells on hills. The main reasons for this are: (1) valleys commonly are formed along fault zones or where the rock contains numerous joints, and (2) many valleys contain permeable glacial deposits that act as a reservoir and may transmit substantial quantities of water to the underlying rocks. The data from Rockland County indicate that lithologic differences among the various types of crystalline rocks only have a minor influence on the yields of wells.

levels in till particularly in recharge areas in the uplands, may fluctuate as much as 10 to 15 feet during a year (Ro 18, fig. 8). However, in discharge areas in the lowlands, the range in fluctuation is much smaller. Owing to the relatively large fluctuation of the water table in till many shallow dug wells go dry during periods of below-normal rainfall.

Most of the wells drawing water from till are large-diameter dug wells less than 25 feet deep. The highest recorded yield of a well in till is 5 gpm. However, the yields of most wells drawing from till are considerably less. A few open-end drilled wells have been constructed in thick deposits of till but no records of their yields are available. In order to obtain a satisfactory yield these wells must terminate in sandy zones.

Till no longer is an important source of water for domestic use in Rockland County because it generally cannot supply water in sufficient quantity for use in modern homes and because the water can be readily polluted by leakage from septic tanks, cesspools, and other sources.

STRATIFIED DRIFT

Geologic Properties

Stratified drift consists of water-laid, crudely to well-sorted beds and lenses of gravel, sand, silt, and clay. The extent and thickness of the deposits are shown on plate 3. The deposits underlie the major stream valleys and some form terraces at elevations as high as 100 feet above present stream levels. The known thickness of the deposits ranges from a few feet to about 300 feet. However, if the estimates of depth to bedrock from seismic data are correct, the greatest thickness of stratified drift, about 600 feet, is in the buried channel of the Hudson River (pl. 4). Large variations in texture within relatively short horizontal and vertical distances (pl. 4 and figs. 2 and 6), are indicative of the rapidly changing conditions under which the stratified drift was deposited. Some of the material was deposited while the ice was advancing but probably most was deposited during the retreat of the ice when lobes and isolated masses of wasting ice occupied large depressions such as the Hudson, Hackensack, and Ramapo valleys. Most of the deposits were laid down on flood plains, as deltas, and in lakes, consequently, they range in grain size from gravel to clay.

For convenience in discussing their water-bearing characteristics the stratified deposits are classified according to their predominant lithology into two groups (1) sand and gravel, and (2) clay and silt.

Elongated bodies of brown fine to coarse sand and gravel were deposited in the major valleys by meltwater streams. In some valleys the sand and gravel is interbedded with silt and clay. In others kame terraces were formed by deposition by streams flowing between the bedrock walls of the valley and the margins of the melting ice. Kame deposits commonly consist of poorly sorted coarse sand, gravel, boulders, and lenses of till. Cross-bedded sand and gravel interbedded with silt and clay were deposited as deltas in a few valleys such as those of the Hackensack River and Cedar Pond Brook.

The sand and gravel ranges widely in thickness from less than one foot to about 190 feet. The thickness of the deposits of sand and gravel penetrated by wells in several valleys is as follows: (1) Ramapo River valley, 116 feet at well Ro 509 near Suffern; (2) Mahwah River valley, 54 feet at well Ro 513; (3) Hackensack River valley, 40 feet (figs. 2 and 6); (4) Minisceongo Creek, 184 feet at well Ro 536; and (5) Hudson River valley, about 70 feet (pl. 4).

Thick beds of clay and silt were laid down in lakes that existed in the area during the melting of the last ice sheet. Thin beds and lenses of lacustrine clay and silt are interbedded with layers of sand and gravel in some of the larger valleys and in kame terraces. Deposits of clay and silt laid down in glacial lakes in thin alternate layers are called varves. Deposits of reddish-brown varved clay and silt in the Hackensack River valley are as much as 30 feet thick (figs. 2 and 6). Bluish-gray varved clay is exposed in several places along the shore of the Hudson River mainly between Haverstraw and Stony

Point and occurs at altitudes from 50 feet above sea level to at least 40 feet below. The clay is interbedded with sand and gravel in a few places and elsewhere rests directly on till. Alternate layers of gray and reddish-brown silty clay and clayey silt occur beneath the Hudson River in deposits as much as 160 feet thick (pl. 4). They are overlain by fossiliferous clay and silt of Recent age and are underlain by stratified sand and gravel and till of Pleistocene age.

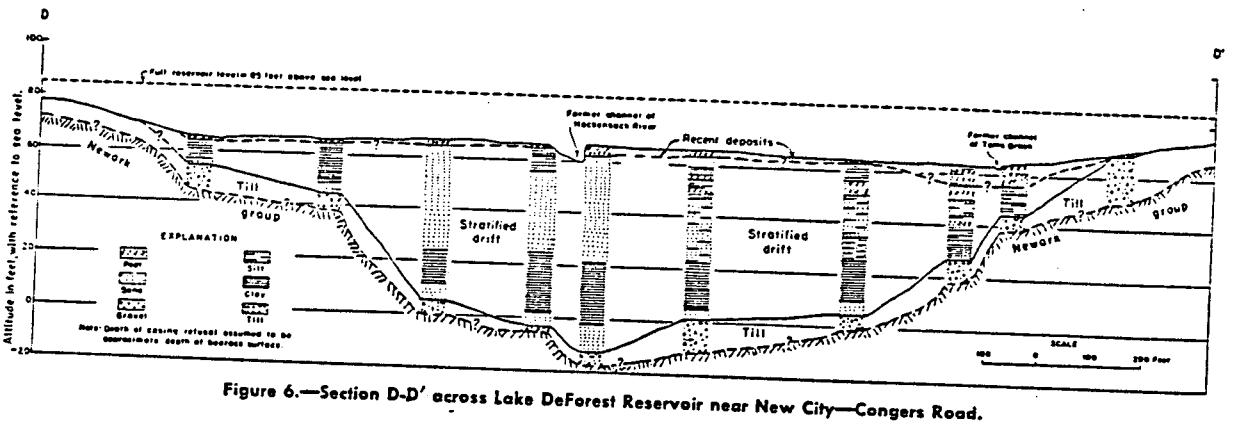


Figure 6.—Section D-D' across Lake DeForest Reservoir near New City—Congers Road.

Water-bearing Properties

The stratified drift in Rockland County is not used to any large extent as a source of water at the present time. The capacity of the drift to yield water varies widely owing to the wide range in the character of the material from relatively impermeable clay to highly permeable sand and gravel. The fine sand, silt, and clay which comprises the bulk of the stratified drift in some valleys yield water very slowly or not at all, whereas the beds of coarse sand and gravel yield copious supplies. The yields of wells in stratified drift range from 8 to 1,700 gpm; the median yield is 183 gpm. The wells range in depth from about 5 to about 170 feet; the median depth is 26 feet. The specific capacity of the wells tapping the drift ranges from 5 to 173 gpm per foot.

Water in stratified drift generally occurs under water-table conditions but locally may be under artesian conditions where permeable beds are overlain by silt and clay. The depth to water ranges from near land surface to 20 feet below. Recharge of the stratified drift takes place mainly by downward percolation of precipitation and by upward leakage from the bedrock. Infiltration of surface water may occur when wells near streams are pumped, and for short periods during flood stages when the river level is higher than the water table. Water in the stratified drift is discharged by evapotranspiration, leakage into streams, and withdrawals by wells.

Miscellaneous pumping-test data obtained from private consultants and drillers are listed in table 18. These data show the drawdowns in pumping wells at different rates of pumping. Figure 7 shows the effect of pumping from well Ro 190 at Suffern on the water levels in two observation wells, Ro 535 and Ro 534 which are about 8 feet north and 410 feet northwest of Ro 190. The hydrographs show that when well Ro 190 is pumped at a rate of about 1,250 gpm, the drawdown in well Ro 535 is about 8 feet and in well Ro 534 is about 1 foot. Well Ro 190 is about 400 feet east of the Ramapo River. Therefore, if the cone of depression around the pumping well was symmetrical it probably reached the river. The graphs in figure 7 do not show the stabilizing effect of recharge from the river owing to the intermittent operation of the pump.

A test conducted in September 1954 at Piermont, in the valley of Sparkill Creek, by Leggette, Brashears, and Graham, consulting ground-water geologists, showed that after well Ro 287 was pumped at a rate of 325 gpm for about 7 hours, the drawdown in well Ro 286, about 250 feet away, was about 13

feet. The drawdown obtained at different pumping rates during another test made in Ro 286 is given in table 18.

RECENT DEPOSITS

The deposits of Recent age consist of sand, gravel, silt, clay, and peat. These deposits overlie deposits of Pleistocene age in the channels and on the floodplains of streams, on lake bottoms, and in swamps. Sand and gravel is mainly restricted to channels and to areas immediately adjacent to the streams. These beds are generally less than 10 feet thick. Silt, clay, and peat are restricted to lakes, the channel of the Hudson River, and the swampy areas adjacent to the other streams. In general these are only a few feet thick but in the Hackensack and Hudson River valleys they reach a thickness of 35 and 120 feet, respectively. The Recent deposits beneath the Hudson River at the Tappan Zee Bridge (pl. 4) are estuarine in character and consist mostly of gray, thin-bedded silt and clay containing shells, plant material, and thin layers of peat and fine sand.

The Recent deposits are of little hydrologic importance because they are thin and of small extent in most places. A few shallow wells may draw water from the permeable beds. Beds of low permeability retard the vertical movement of water into and out of the Recent deposits.

Fluctuations and Trends of Water Levels

Fluctuations of ground-water levels reflect changes in the quantity of water in storage. Recharge from precipitation causes a rise in water levels. Natural discharge, such as spring flow and seepage into streams and lakes, and evapotranspiration; and withdrawals from wells, cause a decline in water levels. Water levels rise when recharge exceeds discharge and decline when discharge exceeds recharge. Short-term fluctuations of water levels in some wells are caused by earthquakes, changes in barometric pressure, and tidal fluctuations.

Figure 8 shows fluctuations in one well (Ro 18) in till and two wells (Ro 77 and Ro 99) in the Newark group, discharge of the Hackensack River at Rivervale, N. J., and precipitation at Spring Valley, N. Y. The hydrograph for well Ro 18 shows seasonal fluctuations in an area unaffected by pumping. The maximum annual range of fluctuations is about 12 feet. The graph shows that, in general, water levels begin to rise in late fall and reach a peak during the following spring. The lowest levels are reached during the summer and early fall when evapotranspiration is greatest and natural discharge exceeds recharge. Departures from the normal seasonal pattern result from unusual precipitation. For example, the two peak levels in late 1955 were caused by hurricanes in August and by record-breaking precipitation in October.

Wells Ro 77 and Ro 99 show a long-term range in fluctuations of about 30 and 40 feet, respectively. The fluctuations in both wells are affected by pumping from wells. Well Ro 77 is at the south end of the Lederle Laboratories plant in Pearl River where an average of about 1 mgd is pumped from the Newark group. The graph for well Ro 77, which is based on records from an automatic water-level recorder, shows that the rise in water level which starts in the spring generally reaches a peak in May. Water levels normally decline during the summer and fall, stabilize for a few months in the winter, and then rise in the following spring. The failure of the water levels to recover to normal peak levels in 1954 is a reflection of unusually heavy and continuous pumping during that year. In 1955, a reduction in pumpage together with above-normal rainfall resulted in an essentially continuous rise of water levels throughout the year.

The hydrograph for Ro 99 at the Summit Park Sanitorium is based in part on records from an automatic water-level recorder and in part on periodic measurements. The graph shows a wide range in seasonal fluctuation. The water level generally declines about 40 feet during the summer months. On September 2, 1959, the water level declined to a record low of 140 feet below the land surface. Part of the decline is natural and part probably reflects large withdrawals from the Newark group. The peak level in 1958 was slightly below the peak level of the previous years of record.

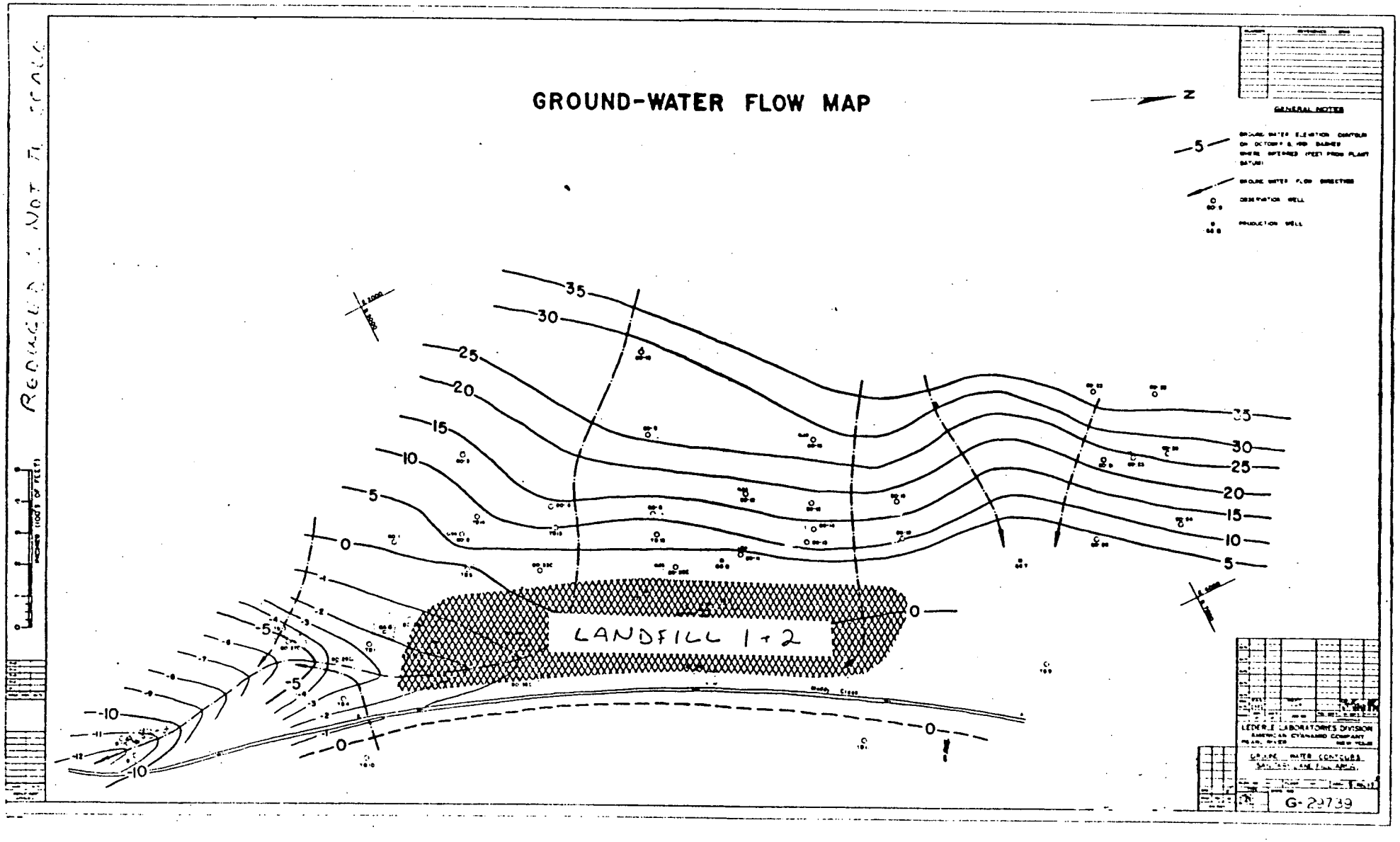
Table 17.—Records of selected wells and test borings in Rockland County—(Continued)

Well number	Location coordinates	Owner or occupant	Year completed	Altitude (feet)	Depth of well (feet)	Diameter (inches)	Depth to bedrock (feet)	Geologic unit	Depth to water (feet)	Type of pump	Yield (gpm)	Temperature °F	Use	Remarks
Ro 50	16X, 14.2S, 1.3E	Rockland State Hospital	1929	100.5	270	16	...	Newark group	59 1951	T	100	..	I	Well No. 1. (a).
Ro 51	16X, 14.4S, 1.3E	do.	1929	100.5	250	16	...	do.	60 1951	T	20	..	I	Well No. 2.
Ro 52	16X, 14.3S, 1.4E	do.	....	113.5	326	16	...	do.	52 1951	T	105	..	I	Well No. 9. Near Ro 50. (a).
Ro 53	16X, 14.4S, 1.1E	do.	....	106.5	295	16	...	do.	70 1951	T	100	..	I	Well No. 3. Near Ro 51. (a).
Ro 54	16X, 14.1S, 1.0E	do.	1929	91.5	435	16	...	do.	38 Aug. 1951	DWT	65	..	I	Well No. 6. Near Ro 57. (a).
Ro 55	16X, 14.1S, 1.3E	do.	1929	102	291	16	...	do.	36 Aug. 1951	DWT	65	..	I	Well No. 7. (a).
Ro 56	16X, 14.3S, 1.1E	do.	1929	75	305	16	...	do.	46.5 Aug. 1951	DWT	100	..	I	Well No. 10. Near Ro 50. (a).
Ro 57	16X, 14.4S, 0.9E	do.	1929	78	301	16	...	do.	10 July 1939	DWT	100	..	I	Well No. 12. (a).
Ro 58	16X, 13.0S, 1.4E	do.	1936	91.2	302	10	20	do.	26 Aug. 1951	DWT	60	..	I	Well No. 13.
Ro 59	16X, 13.5S, 1.4E	do.	1938	82.6	300	10	...	do.	26 Aug. 1951	DWT	60	..	I	Well No. 15. Near Ro 58.
Ro 60	16X, 12.3S, 1.5E	do.	1936	81.5	304	10	72	do.	23.4 Aug. 1951	DWT	50	54	I	Well No. 17. Near Ro 61. Natural flow 10 gpm in 1936; water level 10 ft. above land surface.
Ro 61	16X, 12.2S, 1.7E	do.	1938	73	178	10	30	do.	10.5 Aug. 1951	DWT	100	..	I	Well No. 10. Formerly flowing well. Casing, 0–56 ft.
Ro 62	16X, 12.7S, 1.5E	do.	1938	133	318	10	...	do.	27 Aug. 1951	DWT	50	..	I	Well No. 20. Water level 15 ft., July 1939.
Ro 63	16X, 12.4S, 1.5E	do.	1936	88.5	224	10	72	do.	19.5 Aug. 1951	DWT	150	54	I	Well No. 16. Flows 25 gpm; water level 10 ft. above land surface in 1936. (b).
Ro 64	16X, 13.5S, 2.4E	Sisters of St. Dominic	1923	175	405	10	19	do.	44	DWT	128	..	I	(a).
Ro 65	16X, 12.1S, 1.0W	Lederle Laboratories, Inc.	1937	328	282	8	25	do.	35 1957	DWT	40	52	C	Well A. Yield in 1937 reported to be 100 gpm. Water level 25 ft., 1937. Ro 66, nearby. (a).
Ro 66	16X, 12.1S, 0.9W	do.	1942	330	334	8	...	do.	44 Dec. 1946	DWT	40	52	U	Well B. Drawdown 118 ft. when pumping 150 gpm 1942. Abandoned 1953. Ro 65, nearby. (a).
Ro 67	16X, 12.2S, 0.9W	do.	1939	321	310	8	...	do.	30 1957	DWT	90	52	C	Well C. Near Ro 77. Drawdown 154 ft. when pumping 150 gpm, 1946. Water level 30 ft., 1939. (a).
Ro 68	16X, 11.9S, 1.0W	do.	1941	312	718	8	...	do.	50 1957	DWT	44	54	C	Well D. Near Ro 73. Drawdown 190 ft. when pumping 100 gpm, 1947. Water level 48 ft., Apr. 1947. (a).
Ro 69	16X, 12.1S, 1.1W	do.	1941	323	400	8	...	do.	28 Apr. 1947	DWT	85	52	C	Well E. Near Ro 77. Water level 15 ft., Dec. 1946. (a).
Ro 70	16X, 12.1S, 0.8W	do.	....	315	175	6	...	do.	35 Apr. 1947	DWT	36	52	U	Well F. Drawdown 102 ft. when pumping 36 gpm, 1947. Abandoned 1949. (a).
Ro 71	16X, 12.1S, 1.4W	do.	1941	248	258	24–10	29	do.	Flows Apr. 1957	DWT	220	52	C	Well G. Drilled by rotary method. Specific capacity 1.5 gpm/ft. Flow 25 gpm, 1941. (a).

Table 17.—Records of selected wells and test borings in Rockland County—(Continued)

Well number	Location coordinates	Owner or occupant	Year completed	Altitude (feet)	Depth of well (feet)	Diameter (inches)	Depth to bedrock (feet)	Geologic unit	Depth to water (feet)	Type of pump	Yield (gpm)	Temperature °F	Use	Remarks
Ro 72	16X, 12.1S, 1.2W	Lederle Laboratories, Inc.	1942	303	291	10	86	Newark group	53 Aug. 1950	DWT	20	52	U	Well H. Near Ro 71. Drawdown 157 ft., when pumping 96 gpm, 1942. Water level 33 ft., 1942. Abandoned 1950. Casing, 0-94 ft. (b).
Ro 73	16X, 11.0S, 0.8W	do.	1949	333	328	12	40	do.	80 1957	DWT	30	52	C	Well L. (a).
Ro 74	16X, 11.8S, 1.3W	do.	1950	273	302	12	24	do.	14 1957	DWT	265	52	C	Well T. Specific capacity, 1.8 gpm/ft., 1951. Water level 10 ft., Nov. 1950. Casing, 0-37 ft.
Ro 75	16X, 11.0S, 1.1W	do.	1949	273	300	12	45	do.	15 1957	DWT	185	52	C	Well P. Near Ro 74. Yield reported as 185 gpm with pumping level at 195 ft., 1951. (a).
Ro 76	16X, 11.0S, 1.4W	do.	1950	273	300	12	42	do.	5 1957	DWT	50	52	..	Well Q. Casing, 0-47 ft.
Ro 77	16X, 12.3S, 1.0W	do.	1950	338	350	12	28	do.	48.0 1957	DWT	67	52	O	Well S. Specific capacity, 0.5 gpm/ft., 1950. Water-level record since 1952. Casing, 0-30 ft. (c).
Ro 78	16X, 11.8S, 1.0W	do.	1949	308	341	12	40	do.	90 1952	DWT	65	52	C	Well M. Near Ro 73. Yield 65 gpm with pumping level at 205 ft., 1951. (a).
Ro 79	16X, 12.4S, 1.2W	do.	1951	293	350	12	33	do.	40 1951	...	40	52	U	Well U. Specific capacity 0.2 gpm/ft. (a).
Ro 80	16X, 11.6S, 1.1W	do.	1951	303	350	12	37	do.	35 1951	DWT	110	51	C	Well V. Specific capacity, 0.6 gpm/ft., 1951. Casing, 0-45 ft. (a).
Ro 81	16X, 9.0S, 2.4W	Spring Valley Water Works & Supply Co.	1927	455.1	300	8	50	do.	42 1949	DWT	350	..	PS	Well No. 1, Spring Valley field. Casing, 0-50 ft. Ro 82-Ro 84 nearby. (a).
Ro 82	do.	do.	1928	447.9	450	8	50	do.	63 1949	DWT	350	..	PS	Well No. 2. Near Ro 81. Casing, 0-50 ft. (a).
Ro 83	16X, 9.1S, 2.4W	do.	1924	445.3	253	12	50	do.	50 1940	DWT	400	..	PS	Well No. 3. Near Ro 81. Casing, 0-70 ft. (a).
Ro 84	16X, 9.0S, 2.4W	do.	1924	452.2	256	16-12	50	do.	59 1949	DWT	300	..	PS	Well No. 4. Near Ro 81. Casing, 0-55 ft. (a).
Ro 85	16X, 9.0S, 2.3W	do.	1927	442.5	252	12	50	do.	63 1949	DWT	675	..	PS	Well No. 6. Near Ro 81. Casing, 0-121 ft. (a).
Ro 86	16X, 9.1S, 2.4W	do.	1948	447.3	305	12	39	do.	52 1948	DWT	600	..	PS	Well No. 17. Near Ro 81. Casing, 0-77 ft. Specific capacity, 9 gpm/ft. In 1948 yield was 600 gpm with a drawdown of 65 ft. while five wells nearby were in operation. (a) (b).
Ro 87	16X, 15.3S, 3.3E	do.	1931	59	498	12-6	54	do.	6 1940	DWT	400	..	PS	Well No. 8, Sparkill field. Ro 89 nearby. Casing, 0-62 ft. Specific capacity, 2.3 gpm/ft. (a).
Ro 88	do.	do.	1941	72.5	458	12	92	do.	23 1940	DWT	200	..	PS	Well No. 11. Near Ro 87. Casing, 0-118 ft. Drawdown 182 ft. when pumping 290 gpm in 1940. (a).
Ro 89	do.	do.	1941	58	328	10	77	do.	9 1940	DWT	200	..	PS	Well No. 12. Near Ro 87. Casing, 0-88 ft. Specific capacity, 1.1 gpm/ft., 1940. (a) (b).
Ro 90	16X, 11.7S, 0.2W	do.	1943	260	325	10	88	do.	24 1942	DWT	440	54	PS	Well No. 13, Nanuet field. Near Ro 91. Casing, 0-108 ft. Drawdown 75 ft. when pumping 665 gpm in 1941. (a) (b).
Ro 91	16X, 11.7S, 0.3W	do.	1943	272	375	10	77	do.	30 1942	DWT	480	..	PS	Well No. 14. Ro 90, nearby. Casing, 0-95 ft. Specific capacity, 5.1 gpm/ft., 1942. (a) (b).
Ro 92	16X, 13.0S, 2.4E	do.	1948	174.8	305	12	25	do.	43 1947	DWT	435	..	PS	Well No. 15, Blauvelt field. Casing, 0-60 ft. Specific capacity, 4.5 gpm/ft. in 1947. (a) (b).

A-9-11-11


GROUND-WATER FLOW MAP
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LANDFILL 1+2
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NYSDEC
New Paltz

LEDERLE LABORATORIES

Lederle

A Division of AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK 10965
AREA CODE 914 735-5000

October 3, 1985

Mr. Ramanand Pergadia
Senior Sanitary Engineer
NYSDEC, Region III
21 South Putt Corners Rd
New Paltz, NY 12561-1696

RE: Lederle Laboratories
Completed Sanitary
Landfills No. 1 and 2

Dear Mr. Pergadia,

We are in receipt of your letter requesting copies of drawings and analytical results pertaining to the reference completed Sanitary Landfills #1 and 2.

We are enclosing the 1981 "NYSDEC Project Winter" analysis report on monitoring wells sampled in the landfill area, Lederle drawing G-28555C "Test Boring Landfill Area" and monitoring well log data which is the information you requested on your plant visit of September 12, 1985.

In addition we are also enclosing a copy of the information supplied to Mr. John Parnell, of the Rockland County Department of Health. The information supplied to Mr. Parnell is the priority pollutant analysis of the ground and surface waters at the point where the waters leave the Lederle plant property. Also included is the priority pollutant analysis of the drinking water supplied to the plant by Spring Valley Water Company and the Lederle well water which is utilized for cooling in the plant.

Lederle DWG G-28555C has been highlighted to indicate both the wells that were sampled during the "Project Winter Analysis" and the wells monitoring the groundwater leaving the plant.

If you have further concerns, please contact this office.

Very truly yours,

Carlene Bassell

Carlene Bassell, P.E.
Manager, Environmental
Technology

TJR:cit
Encl.

A-11.2.4

ANALYTICAL [illegible]

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSE[illegible]ATION
"PROJECT WINTER" ANALYSES

Report Date: 6/10/81

[illegible] 30 23A

[illegible]AMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 44S02 D02 (2/18/81)	
[illegible]tal Organic Carbon	mg/l	61	
[illegible]ue Color	Pt-Co Units	40 X	
[illegible]or	T.O.N.	38 X	3 [illegible]
[illegible]lfate	mg/l	<2	
[illegible]tal Filterable Residue (180°C)	mg/l	2,200	
[illegible]	Standard Units	6.94	
[illegible]nductance (at 25°C)	μmhos/cm	4,230	
[illegible]tal Arsenic	μg/l	5	
[illegible]tal Barium	mg/l	1.1 X	1.0 mg/l
[illegible]tal Cadmium	mg/l	0.003	
[illegible]tal Chromium	mg/l	0.064 X	0.05 mg/l
[illegible]tal Lead	mg/l	0.03	
[illegible]tal Mercury	μg/l	<3	
[illegible]tal Selenium	μg/l	<3	
[illegible]tal Silver	mg/l	<0.003	
[illegible]tal Iron	mg/l	190 X	0.3 mg/l (P)
[illegible]tal Manganese	mg/l	11 X	0.05 mg/l (P)
[illegible]tal Copper	mg/l	0.144	
[illegible]tal Zinc	mg/l	0.353	
[illegible]ndrin	μg/l	<0.03	
[illegible]indane	μg/l	<0.02	
[illegible]thoxychlor	μg/l	<0.1	
[illegible]oxaphene	μg/l	<0.5	
[illegible],4-D	μg/l	<0.2	
[illegible],4,5-TP (Silvex)	μg/l	<0.05	

[illegible]OMMENTS: Refer to General Comments.

FOR RECRA RESEARCH, INC. [signature]

DATE 6/10/81

[illegible]RA RESEARCH, INC.

[illegible]. #81-105C

A-11-34

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
"PROJECT WINTER" ANALYSES

80-12 Report Date: 6/10/81

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 44S02 U01 (2/19/81)	80-22 44S02 U02 (2/19/81)
Total Organic Carbon	mg/l	1	<1
True Color	Pt-Co Units	5.0	7.5
Odor	T.O.N.	51	<1
Sulfate	mg/l	33	120
Total Filterable Residue (180°C)	mg/l	200	360
pH	Standard Units	7.74	7.85
Conductance (at 25°C)	µmhos/cm	290	490
Total Arsenic	µg/l	<3	<3
Total Barium	mg/l	<0.1	<0.1
Total Cadmium	mg/l	0.003	<0.003
Total Chromium	mg/l	0.004	0.004
Total Lead	mg/l	<0.04	<0.04
Total Mercury	µg/l	<3	<3
Total Selenium	µg/l	<3	<3
Total Silver	mg/l	<0.003	<0.003
~~Total Iron~~	mg/l	~~2.61~~ ×	~~0.85~~ × 0.23 mg/l
~~Total Manganese~~	mg/l	~~0.26~~	~~0.07~~ × 0.05 mg/l
Total Copper	mg/l	0.016	0.008
Total Zinc	mg/l	0.058	0.052
Endrin	µg/l	-	<0.03
Lindane	µg/l	-	<0.02
Methoxychlor	µg/l	-	<0.2
Toxaphene	µg/l	-	<0.5
2,4-D	µg/l	-	<0.2
2,4,5-TP (Silvex)	µg/l	-	<0.05

COMMENTS: Sample container for organics was broken during shipment for Sample 44S02-001. Due to breakage of sample container during shipment, inorganic parameters for Sample 44S02-002 were subsampled from the corresponding organic sample bottle.

FOR RESEARCH, INC. Larry E. Rovegnant

DATE 6/10/81

RESEARCH INC.

881-105D

A-11·4·4

ANALYTICAL RESULTS

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
"PROJECT WINTER" ANALYSES

Report Date: 6/10/81

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 44S02 D01 (2/19/81)	44S02 D03 (2/19/81)	44S02 D04#2 (2/19/81)
Total Organic Carbon	mg/l	53	10	7.5
True Color	Pt-Co Units	50	2.5	12.5
Odor	T.O.N.	2.4	1.4	2.0
Sulfate	mg/l	14	38	52
Total Filterable Residue (180°C)	mg/l	1,700	1,200	1,000
pH	Standard Units	7.50	6.95	6.77
Conductance (at 25°C)	µmhos/cm	3,100	1,970	1,500
Total Arsenic	µg/l	<3	<3	<3
Total Barium	mg/l	0.67	0.46	0.36
Total Cadmium	mg/l	<0.003	<0.003	0.004
Total Chromium	mg/l	0.040	<0.004	0.008
Total Lead	mg/l	<0.04	<0.04	0.05
Total Mercury	µg/l	<3	<3	<3
Total Selenium	µg/l	<3	<3	<3
Total Silver	mg/l	0.003	<0.003	<0.003
~~Total Iron~~	mg/l	[illegible]	[illegible]	[illegible]
~~Total Manganese~~	mg/l	[illegible]	[illegible]	[illegible]
Total Copper	mg/l	1.1	0.004	0.026
Total Zinc	mg/l	1.1	0.083	0.040
Endrin	µg/l	-	<0.03	<0.03
Lindane	µg/l	-	<0.02	0.03
Methoxychlor	µg/l	-	<0.1	<0.1
Toxaphene	µg/l	-	<0.5	<0.5
2,4-D	µg/l	-	<0.2	<0.2
2,4,5-TP (Silvex)	µg/l	-	<0.05	<0.05

COMMENTS: Sample container for organics was broken during shipment for Sample 44S02-D01.

[illegible] RESEARCH, INC. [signature]

DATE 6/10/81

CHA RESEARCH INC

I.D. #81-105D

A-12-1-19

COMPUCHEM LABORATORIES

May 14, 1987

Mr. Donald Reihard
Lederle Laboratories
Middletown Road
Pearl River, NY 10965

Dear Mr. Reihard:

We at CompuChem® are pleased to provide our report for the analysis you requested. Data for the following sample are enclosed:

Your ID Number	Our ID Number	Analysis Code	Order Number	Description of Work Requested
WELL WATER	128109	003	11349	Phenols
#6	128113	003	11349	Phenols

To obtain additional technical information concerning this report, please contact your Sales Representative. In addition to resolving your questions, they can provide you with a complete overview of our line of services and assist you in identifying those services which will effectively and efficiently support your monitoring program.

For your convenience, your Customer Service Representative can help you place a new order, obtain information about a sample's status or obtain assistance with sample logistics. Your Sales Representative and your Customer Service Representative can be reached at 1/919-549-8263.

Thank you for choosing CompuChem®. We would like to continue providing you analytical support and services. We would appreciate your comments regarding the quality of services you have received from CompuChem®; client satisfaction is important to us. Please address your comments to your Sales or Customer Service Representative at the address given below.

Sincerely,

Donald Ramsey

for Mary E. Mitchell
Supervisor, Report Deliverables

cc: Accounting
(Cover letter only)

A-122.19

COMPUCHEM LABORATORIES

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Mr. Donald Reihard
Lederle Laboratories
Middletown Road
Pearl River, NY 10965

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE PHENOLS ANALYZED
1.	WELL WATER	128109	04/17/87	04/23/87
2.	[illegible]	128113	04/17/87	04/23/87

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: WELL WATER
COMPUCHEM SAMPLE NUMBER: 128109

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. PHENOLS, TOTAL	0.028	0.010

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: [illegible]
COMPUCHEM SAMPLE NUMBER: 128113

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. PHENOLS, TOTAL	0.015	0.010

COMPOUND LIST - INORGANIC PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: PEARLBROOK
COMPUCHEM SAMPLE NUMBER: 116672

	UG/L
1. ANTIMONY, TOTAL	53U
2. ARSENIC, TOTAL	1.8U
3. BERYLLIUM, TOTAL	1U
4. CADMIUM, TOTAL	5U
5. CHROMIUM, TOTAL	9U
6. COPPER, TOTAL	2U
7. LEAD, TOTAL	3U
8. MERCURY, TOTAL	0.40
9. NICKEL, TOTAL	38U
10. SELENIUM, TOTAL	2.5U
11. SILVER, TOTAL	4U
12. THALLIUM, TOTAL	2.6U
13. ZINC, TOTAL	80

U - Indicates element was analyzed for but not detected. Report with the detection limit value (e.g. 10U).

Value - If the result is a value greater than or equal to the instrument detection limit but less than the EPA Contract Laboratory Program (CLP) Contract Required Detection Limit (CRDL), the value is reported in brackets (i.e.,[10]).

A-12-6-19

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: PEARLBROOK
COMPUCHEM SAMPLE NUMBER: 116668

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. CYANIDE, TOTAL	BDL	0.010

BDL = BELOW DETECTION LIMITS

A-12-7-19

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: PEARLBROOK
COMPUCHEM SAMPLE NUMBER: 116670

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. PHENOLS, TOTAL	BDL	0.010

BDL = BELOW DETECTION LIMITS

COMPOUND LIST - INORGANIC PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: 83-1
COMPUCHEM SAMPLE NUMBER: 116652

	UG/L
1. ANTIMONY, TOTAL	53U
2. ARSENIC, TOTAL	1.8U
3. BERYLLIUM, TOTAL	1U
4. CADMIUM, TOTAL	5U
5. CHROMIUM, TOTAL	9U
6. COPPER, TOTAL	2U
7. LEAD, TOTAL	3U
8. MERCURY, TOTAL	0.36
9. NICKEL, TOTAL	38U
10. SELENIUM, TOTAL	2.5U
11. SILVER, TOTAL	4U
12. THALLIUM, TOTAL	2.6U
13. ZINC, TOTAL	[4.8]

U - Indicates element was analyzed for but not detected. Report with the detection limit value (e.g. 10U).

Value - If the result is a value greater than or equal to the instrument detection limit but less than the EPA Contract Laboratory Program (CLP) Contract Required Detection Limit (CRDL), the value is reported in brackets (i.e.,[10]).

A-12-9-19

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: 83-1
COMPUCHEM SAMPLE NUMBER: 116649

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. PHENOLS, TOTAL	BDL	0.010

BDL = BELOW DETECTION LIMITS

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: 83-1
COMPUCHEM SAMPLE NUMBER: 116648

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. CYANIDE, TOTAL	BDL	0.010

BDL = BELOW DETECTION LIMITS

COMPOUND LIST - INORGANIC PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: 81-1A
COMPUCHEM SAMPLE NUMBER: 116629

	UG/L
1. ANTIMONY, TOTAL	53U
2. ARSENIC, TOTAL	1.8U
3. BERYLLIUM, TOTAL	1U
4. CADMIUM, TOTAL	5U
5. CHROMIUM, TOTAL	9U
6. COPPER, TOTAL	[6.8]
7. LEAD, TOTAL	12
8. MERCURY, TOTAL	14
9. NICKEL, TOTAL	38U
10. SELENIUM, TOTAL	2.5U
11. SILVER, TOTAL	4U
12. THALLIUM, TOTAL	2.6U
13. ZINC, TOTAL	2740

U - Indicates element was analyzed for but not detected. Report with the detection limit value (e.g. 10U).

Value - If the result is a value greater than or equal to the instrument detection limit but less than the EPA Contract Laboratory Program (CLP) Contract Required Detection Limit (CRDL), the value is reported in brackets (i.e.,[10]).

A-12-12-19

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: 81-1A
COMPUCHEM SAMPLE NUMBER: 116626

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. PHENOLS, TOTAL	BDL	0.010

BDL = BELOW DETECTION LIMITS

A-12.13.19

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: 81-1A
COMPUCHEM SAMPLE NUMBER: 116625

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. CYANIDE, TOTAL	BDL	0.010

BDL = BELOW DETECTION LIMITS

A-12-14-19

COMPOUND LIST - INORGANIC PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: WELLWATER
COMPUCHEM SAMPLE NUMBER: 116622

	UG/L
1. ANTIMONY, TOTAL	53U
2. ARSENIC, TOTAL	1.8U
3. BERYLLIUM, TOTAL	1U
4. CADMIUM, TOTAL	5U
5. CHROMIUM, TOTAL	9U
6. COPPER, TOTAL	2U
7. LEAD, TOTAL	3U
8. MERCURY, TOTAL	0.34
9. NICKEL, TOTAL	38U
10. SELENIUM, TOTAL	2.5U
11. SILVER, TOTAL	4U
12. THALLIUM, TOTAL	2.6U
13. ZINC, TOTAL	[10]

U - Indicates element was analyzed for but not detected. Report with the detection limit value (e.g. 10U).

Value - If the result is a value greater than or equal to the instrument detection limit but less than the EPA Contract Laboratory Program (CLP) Contract Required Detection Limit (CRDL), the value is reported in brackets (i.e.,[10]).

A-12-15-19

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: WELLWATER
COMPUCHEM SAMPLE NUMBER: 116621

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. PHENOLS, TOTAL	BDL	0.010

BDL = BELOW DETECTION LIMITS

A-12-17-19

COMPOUND LIST - INORGANIC PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: 81-C
COMPUCHEM SAMPLE NUMBER: 116617

	UG/L
1. ANTIMONY, TOTAL	53U
2. ARSENIC, TOTAL	1.8U
3. BERYLLIUM, TOTAL	1U
4. CADMIUM, TOTAL	5U
5. CHROMIUM, TOTAL	9U
6. COPPER, TOTAL	[9.3]
7. LEAD, TOTAL	3U
8. MERCURY, TOTAL	0.36
9. NICKEL, TOTAL	47
10. SELENIUM, TOTAL	2.5U
11. SILVER, TOTAL	4U
12. THALLIUM, TOTAL	2.6U
13. ZINC, TOTAL	31

U - Indicates element was analyzed for but not detected. Report with the detection limit value (e.g. 10U).

Value - If the result is a value greater than or equal to the instrument detection limit but less than the EPA Contract Laboratory Program (CLP) Contract Required Detection Limit (CRDL), the value is reported in brackets (i.e.,[10]).

A-12.18.19

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: 81-1C
COMPUCHEM SAMPLE NUMBER: 116616

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. PHENOLS, TOTAL	BDL	0.010

BDL = BELOW DETECTION LIMITS

A-12.19.19

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: 81-C
COMPUCHEM SAMPLE NUMBER: 116615

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. CYANIDE, TOTAL	BDL	0.010

BDL = BELOW DETECTION LIMITS

APPENDIX B

B-1.1.1

INTERVIEW ACKNOWLEDGEMENT FORM

Site Name: Lederle Lab

I.D. Number: 344003

Date: 6/3/87

Person Contacted: John Parnell

Title: Solid Waste Engineer

Affiliation: Rockland Co. Dept. of Health

Address & Phone No.:
Rockland Co. Dept. of Health
Sanatorium Road
Pomona, N Y 10970
914-354-0200, Ex. 2524

Type of Contact: In person

Person(s) Making Contact: L. Radko

Interview Summary:

Lederle Lab has many monitoring and processing wells. Spring Valley Water Co. could have information about drinking wells.

From Jim Hardy of the New Paltz DEC, Lederle Lab has three separate landfills. Lederle Lab is considering doing a Phase II study with their own consultant.

A-12.16.19

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: WELLWATER
COMPUCHEM SAMPLE NUMBER: 116620

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. CYANIDE, TOTAL	BDL	0.010

BDL = BELOW DETECTION LIMITS

B-2-1-1

INTERVIEW ACKNOWLEDGEMENT FORM

Site Name: Lederle Lab

I.D. Number: 344003

Date: 6/12/87

Person Contacted: Carlene Bassell/Richard Guterl/Russell Slayback

Title: Manager, Env. Tech./Manager, Utilities & Env. Oper./President

Affiliation: Lederle Lab/Lederle Lab/Leggette, Brashears & Graham, Inc.

Address & Phone No.:

Lederle Laboratories	Leggette, Brashears & Graham, Inc.
Pearl River, N Y 10965	72 Danbury Road, Wilton, CT 06897
* 914-735-5000	203-762-1207

Type of Contact: In person

Person(s) Making Contact: L. Radko

Interview Summary:

Lederle Lab has done their own investigation of the landfills. They found no record of hazardous waste disposal. They have monitored the groundwater and found no evidence of hazardous waste. They see no ~~reason to do~~ basis for * a Phase II study ~~on their own.~~ * Have three separate landfills; both smaller landfills have leachate collection lines. In 1949 they used incinerator for waste. The brook running along the main landfill was relocated. The brook is above the groundwater. Landfill * 1+2 was used from 1946-79, 12 acres. Landfill 2A was used from 1978-82, four acres. The active landfill, 3A started in 1982. Landfill 2A was re-opened to dispose of a building with very little asbestos. Plant employs about 4,000 people.

(Given landfill disposal records.)

(Promised * to send copies of reports and pictures: Water test reports 81-C, 81-1A (exit), 83-1 (property line); well water; Pearl Brook) This data was provided.

Acknowledgement:

I have read the above transcript and I agree that it is an accurate summary of the information verbally conveyed to Gibbs & Hill interviewers, or as I have revised below, is an accurate account.

Revisions (please write in corrections to above transcript):
Only Landfill 1+2 is subject to investigation. Information provided on other landfills was for reference purposes only.
Also, * indicates areas of disagreement, corrected above.

Signature: Carlene Bassell Date: 3/31/88

B-3.1.2

C. D. BASSELL

DEC 2 1987

RECEIVED

INTERVIEW ACKNOWLEDGEMENT FORM

Site Name: Lederle Lab

I.D. Number: 344003

Date: 8/6/87

Person Contacted: Carlene Bassell

Title: Manager, Environmental Technology

Affiliation: Lederle Laboratories

Address & Phone No.:
Lederle Laboratories
Pearl River, N Y 10965
914-735-5000

Type of Contact: In person

Person(s) Making Contact: Propersi/Radko

Interview Summary:

There are three incinerators at the ~~landfill~~ plantsite. One for plant trash, one for both trash and pathological waste, and one is a standby for pathological waste in a separate pathological hearth. Also, there is an old dismantled incinerator Pathological wastes include ~~human~~ blood, anything containing or injected with an infectious substance or virus. Currently, landfill 3A is active and receives ash. Landfill 2A is not lined but underlain by naturally impermeable (10^{-6}) material and has leachate collection. Landfill 3A is lined with compost and soil. Landfills 1 and 2 are not lined and lie in an old ~~river~~ stream bed.

~~Lederle~~ Labs started as a horse farm, went into chemical, not biological, industries. In the early 1950's started producing antibiotics, the production of which uses solvents.

Landfills 1 and 2 had an acid pit.

Currently, mixed solvents are disposed of off site. Drugs and medicines ~~no longer counted as~~ are not hazardous waste. Lab wastes go off site.

Glass debris, plant trash were disposed of in landfills 2A and 3A.

Landfills 1 & 2 ~~and 2A were~~ was closed using two feet of clay-like material (compost) and vegetation.

~~Currently the daily cover is compost.~~ as cover For the inactive landfill soil was used. Approximate ratio of four parts cover to one part waste.

** LF 3A has active permit. LF 2A had active permit, now closed in accordance with approved closure plan.

Currently, all hazardous wastes are shipped out.

American Cyanamide owns the 600 acres covered by Lederle Labs.

Muddy Creek originates on the property. The shortest distance to the landfills is 50 feet.

Lederle Lab was at the site, ~~as a horse farm~~, in 1906. Horses maintained for biological production

Muddy Creek flows into Paseack Brook which flows to the Oradell Reservoir.

The creek is tested at the property line for oil, grease, temp., pH and priority pollutants.

Non contact Cooling water goes into creek.

Spring Valley Water Co. supplies drinking water to the Lab.

Unknown - ~~the number of workers who came, or come into contact with the landfills.~~ Access to the landfill is restricted.

There is one fence around the landfills and one fence around the perimeter.

~~Odor complaints could be sewage.~~ (Context is missing)

Lab uses compost as cover and for landscaping. Some compost is sold. ~~the Ramapo Landfill and landscapers.~~ Landfills 1 ~~and 2 are~~ is in the water table.

No observed leachate at landfills.

Landfills 2A and 3A are above the water table and have permits.

No metal drums of material deposited at the landfill.

Acknowledgement:

I have read the above transcript and I agree that it is an accurate summary of the information verbally conveyed to Gibbs & Hill interviewers, or as I have revised below, is an accurate account.

Revisions (please write in corrections to above transcript):
Only the inactive landfill designated as landfill 1+2 is under investigation. Information on other solid waste management units was presented as reference. Areas of disagreement are noted below. A separate description was prepared and that form is signed. This form does not provide adequate description.

Signature: _____ Date: _____

B-4·1·1

Telephone Conversation Record

Date: 3/28/88

Time: 11:00 A.

Call by: T. Propersi (Name) of Gibbs & Hill, Inc. (Company)

Answer by: Carlene Bassell (Name) of Lederle Labs (Company)

Contract No: 5019-210

Subject discussed: Interview acknowledgement form & Landfills 1 & 2

SUMMARY OF DISCUSSION, DECISIONS AND COMMITMENTS.

Spoke with Carlene Bassell, Manager Environmental Technology for Lederle Labs in reference to not receiving their signed interview acknowledgment form. I mentioned that she has had several months to provide comments to be incorporated into the final report and that we are now working on that report. I said that she had until Friday, April 1st to provide comments if she wants them (The comments) in the report.

Our conversation than centered on G&H's findings with respect to Landfills 1 and 2. She suggested that these Landfills make no impact on the groundwater. I responded that groundwater data from wells up and down gradients indicate that contaminates are being picked-up in the Landfill. I mentioned that this seemed reasonable since Landfill 1 is in the groundwater. she agreed that it is in the groundwater and said she would recheck her data to determine if there has been any impact.

B-5-1-2

LEDERLE LABORATORIES

A Division of AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK 10965
AREA CODE 914 735-5000

October 16, 1987

Ms. Leah Radko
Asst. Engineer- Civil
Gibbls & Hill, Inc.
Dravo Engineering Co., Inc.
11 Penn Plaza, 15th Floor
New York, NY 10001

REF: Phase I Study Field Investigation
Lederle Laboratories Landfill No. 1&2
Site I.D.# 344003

Dear Ms. Radko,

The purpose of this submission is to provide you with additional information that should assist your effort to complete the Phase I investigation of our site, and to answer in advance any questions that you may have.

The enclosed area photographs of Lederle's Pearl River site were taken in 1946, 1954 and some time between 1964 and 1968. These photographs span the active life of the landfill site currently under investigation.

While you were at our site, we explained the hydrogeology of the area to you and also presented you with water quality data from the downgradient wells identified as 66-G, 83-2, 81-C, and 81-A. The enclosed groundwater contour map of the area supplements our earlier discussions, and indicates the importance of the analytical results from the downgradient wells. These submissions demonstrate that the site is clean (ie. there are no releases of substances of concern and there is no indication of any hazardous waste disposal).

This submission and any previous correspondence should not be construed as an admission of liability or waiver of any rights.

If you have any questions please do not hesitate to contact me at (914) 732-2500. Please note this is a new telepone number.

Very truly yours,

Carlene Bassell, P.E.
Manager, Environmental
Technology

CB:cit
encl.

cc: Mr. Richard Gardineer, P.E.
Regional Solid Waste Engineer
NYS Dept. of Environmental Conservation
Region III
21 South Putt Corners Road
New Paltz, NY 12561-1696

* Mr. Charles Goddard, P.E.
Chief, Bureau of Hazardous Site Control
Div. of Solid and Hazardous Waste
NYS Dept. of Environmental Conservation
50 Wolf Road
Albany, NY 12233-0001

Mr. Thomas Micelli, P.E.
Associate Public Health Engineer
Rockland County Dept. of Health
Sanatorium Road
Pomona, NY 10970

* Mr. Thomas P. Propersi
Project Manager
Gibbs & Hill, Inc.
Dravo Engineering Co., Inc.
11 Penn Plaza, 15th Floor
New York, NY 10001

* Without Attmt.

B-6-1-2

LEDERLE LABORATORIES

A Division of AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK 10965
AREA CODE 914 735-5000

August 6, 1987

Ms. Leah Radko
Asst. Engineer- Civil
Gibbls & Hill, Inc.
Dravo Engineering Co., Inc.
11 Penn Plaza
New York, NY 10001

REF: Phase I Study Field Investigation
Lederle Laboratories Landfill No. 1&2
Site I.D.# 344003

Dear Ms. Radko,

As a followup to your site visit on June 12, 1987, enclosed please find the following:

- a stretch showing the landfill area with locations of the photographs, wells, sampling points and other key features,
- photographs of the landfill,
- a table summarizing the enclosed laboratory data and the elevations of wells,
- laboratory data from groundwater wells and exit surface water.

As discussed, although hazardous wastes were treated on the site, we have no evidence of hazardous waste disposal. We believe the site HRS ranking (copy attached) is zero.

This submission and any previous correspondence should not be construed as an admission of liability or waiver of any rights.

If you have any questions or require additional information, please do not hesitate to contact me.

Very truly yours,

Carlene Bassell, P.E.
Manager, Environmental
Technology

CB:cit
encl.

Letter Copy: Thomas P. Propersi
Project Manager

B.6.2.2

cc: Mr. Richard Gardineer, P.E.
Regional Solid Waste Engineer
NYS Dept. of Environmental Conservation
Region III
21 South Putt Corners Road
New Paltz, NY 12561-1696

Mr, Charles Goddard, P.E.
Chief, Bureau of Hazardous Site Control
Division of Solid and Hazardous Waste
NYS Dept. of Environmental Conservation
50 Wolf Road
Albany, NY 12233

Mr. Thomas Micelli, P.E.
Associate Public Health Engineer
Rockland County Health Dept.
Sanatorium Road
Pomona, NY 10970

B-7-1-2

LEDERLE LABORATORIES

A Division of AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK 10965
AREA CODE 914 735-5000

August 7, 1987

Ms. Leah Radko
Asst. Engineer- Civil
Gibbls & Hill, Inc.
Dravo Engineering Co., Inc.
11 Penn Plaza, 15th Floor
New York, NY 10001

REF: Phase I Study Field Investigation
Lederle Laboratories Landfill No. 1&2
Site I.D.# 344003

Dear Ms. Radko,

As a followup to our August 6, 1987 meeting, enclosed is a copy of our response to Sen. Eckhart's subcommittee investigation, a description of the request (April 18, 1979 letter) and the page from the final summary report which describes our facility.

This submission and any previous correspondence should not be construed as an admission of liability or waiver of any rights.

If you have any questions or require additional information, please do not hesitate to contact me.

Very truly yours,

Carlene Bassell

Carlene Bassell, P.E.
Manager, Environmental
Technology

CB:cit
encl.

Letter Copy: Thomas P. Propersi
Project Manager

B-7.2.2

cc: Mr. Richard Gardineer, P.E.
Regional Solid Waste Engineer
NYS Dept. of Environmental Conservation
Region III
21 South Putt Corners Road
New Paltz, NY 12561-1696

Mr, Charles Goddard, P.E.
Chief, Bureau of Hazardous Site Control
Division of Solid and Hazardous Waste
NYS Dept. of Environmental Conservation
50 Wolf Road
Albany, NY 12233

Mr. Thomas Micelli, P.E.
Associate Public Health Engineer
Rockland County Health Dept.
Sanatorium Road
Pomona, NY 10970

B-8;1·4

LEDERLE LABORATORIES

A Division of AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK 10965
AREA CODE 914 735-5000

March 31, 1988

Mr. Thomas Propersi
Gibbs & Hill, Inc.
Dravo Engineering Companies, Inc.
11 Penn Plaza
New York, NY 10001

Re: Lederle Laboratories Site Number

Dear Mr. Propersi:

Enclosed are the two Interview Acknowledgment forms with corrections. Only one form is signed. A description of the landfill and relevant activities is provided in lieu of the unsigned form.

If you have any questions, please do not hesitate to contact me.

Carlene Bassell

Carlene Bassell, P.E.
Manager, Environmental
Technology

CB:ta
encs.

Lederle Laboratories Site No. 344003
Interview Acknowledge Form

In lieu of the interview acknowledgement form, presented below is an account of the Lederle Laboratories activities as they relate to the inactive Landfill, ID Number 344003.

Most of the history of the inactive landfill (designated LF 1 & 2) was pieced together in 1978 from interviews with long time employees as part of the Senator Eckhart survey response. Since the response to the Eckhart survey resulted in Landfill 1 & 2 being included on New York's registry of "potential hazardous sites", and since these responses provide the only early documentation of waste disposal practices, they are described in more detail below.

Material disposed	Explanation
Acids	Small quantities of acids from laboratory operations were neutralized in an acid pit. The pit contained crushed limestone.
Solvents	There was a fire pit in the landfill where solvents were burned. Additionally small quantities of reactive or explosive laboratory chemiclas were taken to the landfill area and detonated.
Pharmeceutical wastes	These wastes were not hazardous wastes as currently defined.
Paints and pigments	Empty paint cans from maintenance operations were disposed of in the landfill and therefore this item was checked on the survey.
Oil and oil sludges	This item was checked due to the oil and grease component in sewage sludge.

Heavy metals and trace metals	Trace metals were assumed to be present at detectable levels in the sewage sludge and therefore all metals, exclusive of hexavalent chromium were checked.

In sum, we have no reason to believe that there are any substances present in amounts greater than the CERCLA reportable quantity (ie HRS ranking criteria).

Lederle Laboratories has operated on the Pearl River site since 1906. Much of the plant site was essentially used as a horse farm to supply the animals needed for Biological Production. The first incinerator for the destruction of wastes was constructed in 1946. Also in 1946, landfilling operations began on the site now designated Landfill 1. With the production of AUREOMYCIN®, chlortetracycline in 1948, Lederle made a major expansion into the 'Chemical' production of antibiotics.

LF 1 was operated from 1946 through 1966. Early Landfill activities were conducted in a swampy area. To improve the drainage and operations, the stream bed (Muddy Creek) was rerouted. Solvents were burned in the fire pit, and acids neutralized until approximately 1962. Waste in general were burned for volume reduction until approximately 1962.

LF 2,(operated from 1966-1979) was constructed on top of LF 1 and extended to the north. Since LF 2 is on top of LF 1, together they are termed LF 1 & 2, the subject of this investigation. LF 1 & 2 was closed using at least two feet of clay-like material (compost) and vegitation.

Solid (not hazardous) waste landfilling operations are still conducted on site in accordance with NYS Part 360 permit conditions. Landfill 3A is lined and is receiving wastes (incinerator ash, plant trash, glass, debris, etc.). Landfill 2A was constructed, operated and closed in accordance with NYS Part 360 permit conditions. Neither of these landfills are the subject of the current site investigation, I.D. Number 344003.

In 1949 Lederle's trickling filter wastewater treatment system was constructed. There have been several upgrades to the system, which is now a UNOX, pure oxygen biological treatment system. The original trickling filters have been abandoned. Composting of the sludge generated from the wastewater treatment system began in 1954. Composting operations are currently conducted in accordance with NYS Part 360 permit conditions.

There are currently three operational incinerators on site and each has an air emission permit (NY Part 360 permit provisions do not apply since these are not commercial facilities). The incinerator that was constructed in 1946 (B131) was abandoned in 1974. The B180 incinerator has dual heaths, one for plant trash and the other for pathological wastes. The B164 incinerator is for plant trash, and the B60C unit is a standby pathological unit.

Currently, hazardous wastes such as mixed waste solvents and lab chemicals are disposed of off site in approved facilities. Storage of hazardous waste is conducted on site in accordance with Interm Status standards.

The hydrogeology of the Lederle site has been studied extensively and is well defined, particularly in the landfill area. The property line wells were constructed so any potential landfill impact could be monitored. Additionally, Lederle withdraws approximately 2 mgd from production wells in the rock aquifer. The quality of this water is routinely monitored to ensure that there is no contamination.

Muddy Creek originates on Lederle property. Muddy Creek flows into the Pascack Brook, which flows into the Oradell Reservoir, more than 5 miles downstream. The flows from Lederle consist of stormwater and noncontact cooling water. Muddy Creek is monitored at the property line for oil and grease, pH, and tempurature, in accordance with SPDES permit conditions. Additionally, priority pollutant analyses have occasionally been performed, and there are no impacts.

The area is fenced and secure.In conclusion, we do not believe the Lederle Laboratories' LF 1 & 2 should be listed as an inactive hazardous waste site.

APPENDIX C

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID AND HAZARDOUS WASTE
INACTIVE HAZARDOUS WASTE DISPOSAL REPORT

CLASSIFICATION CODE: 2a REGION: 3 SITE CODE: 344003

NAME OF SITE: Lederle Lab.
STREET ADDRESS: Middletown Road
TOWN/CITY: Pearl River, NY COUNTY: Rockland ZIP: 10965

SITE TYPE: Open Dump ___ Structure ___ Lagoon ___ Landfill _X_ Treatment Pond ___

ESTIMATED SIZE: 12 Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME.....: American Cyanamid Co., Lederle Labs.
CURRENT OWNER ADDRESS..: Middletown Road, Pearl River, NY 10965
OWNER(S) DURING USE....: Lederle Labs.
OPERATOR DURING USE....: Same as above
OPERATOR ADDRESS.....: Same as above
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From 1946 To 1979

SITE DESCRIPTION: The Lederle Lab. Landfill is located in Pearl River, New York. Lederle Lab. produces a full line of pharmaceutical and biological products. At this facility there are four landfills. Landfill of concern, landfills 1 and 2 were operated from 1920's to 1946. The landfills have no liner and are in the ground water table.

Landfills 1 and 2 had received incinerator ash, glass, paper, wood, cardboard, metal, vitamin, wastewater treatment sludge, fermentation cake and reactive and explosive chemicals. Documentation also shows that heavy metal, nonpolar solvents, oil and oil sludges, alcohols, salts, pharmaceutical wastes, paint and pigments and asbestos were disposed in the landfills. Levels of heavy metals and phenols exceeding 10 NYCRR Part 703.5 have been found in groundwater.

Landfills 2A and 3 have appropriate liners and operate under NYS 6 NYCRR Part 360.

RECOMMEND: Phase II Investigation.
HAZARDOUS WASTE DISPOSED: Confirmed-X Suspected-

TYPE	QUANTITY (units)
Metal, Vitamins, Wastewater Treatment Sludge, Fermentation Cake, Reactive & Explosive Chemicals. Nonpolar Solvents, Alcohols, Pharmaceutical Wastes, Paint and Pigments, and Asbestos.	677,800 (tons)

ANALYTICAL DATA AVAILABLE:
Air___ Surface Water_X_ Groundwater___ Sediment___ None____

CONTRAVENTION OF STANDARDS:
Groundwater____ Drinking Water____ Surface Water____ Air____

LEGAL ACTION:

TYPE..: State____ Federal____
STATUS: Progress____ Order Signed____

REMEDIAL ACTION:

Proposed____ Under design____ In Progress____ Completed____
NATURE OF ACTION:

GEOTECHNICAL INFORMATION:
SOIL TYPE: Clay, Silt and Gravel.
GROUNDWATER DEPTH: 0

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Odor complaints which may be attributable to the landfill.

ASSESSMENT OF HEALTH PROBLEMS:

Medium	Contaminants Available	Migration Potential	Potentially Exposed Population	Need for Investigation
Air	Likely	Likely	Yes	High
Surface Soil	Unlikely	Highly Likely	No	Medium
Groundwater	Identified	Highly Likely	No	Medium
Surface Water	Identified	Highly Likely	Yes	High

Health Department Site Inspection Date: 03/86.

MUNICIPAL WASTE ID: 56-5-06.